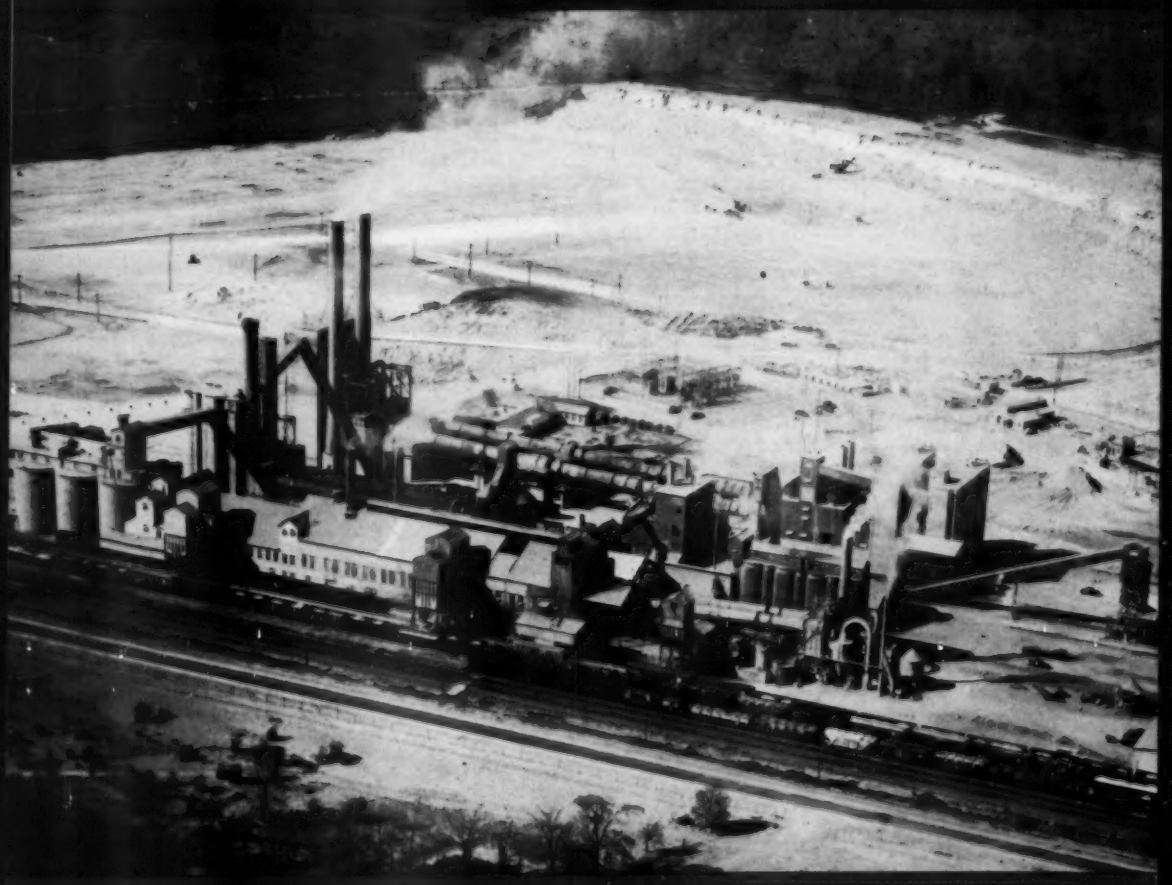
PIT AND QUARRY



FOR DEPENDABLE HEAVY-DUTY SHIPPING SACKS...

there is no substitute for kraft!

Kraft, unconditioned from wood fibers, is the strongest paper known to industry. It was introduced in this country in 1909, just about the time when the first generation of Gilmans started manufacturing bags.

As pioneers, we have spanned the years with practical knowledge, technical skills, packaging experience . . . and our modern, completely integrated facilities are a notable example of kraft paper production and conversion.

Now in our 3rd generation of specialization, we are expert in pulp and paper making, in bag manufacturing, in bag printing, in bag designing.

Dependable as a Source . . .
Dependable as a Service

MADE-TO-ORDER MULTIWALL SHIPPING SACKS
2 TO 6 PLY—PRINTED OR PLAIN

- Sewn Valve
- Sewn Open Mouth
- Pasted Valve
- Pasted Open Mouth
- Flat Sewn Valve
- Flat Sewn Open Mouth

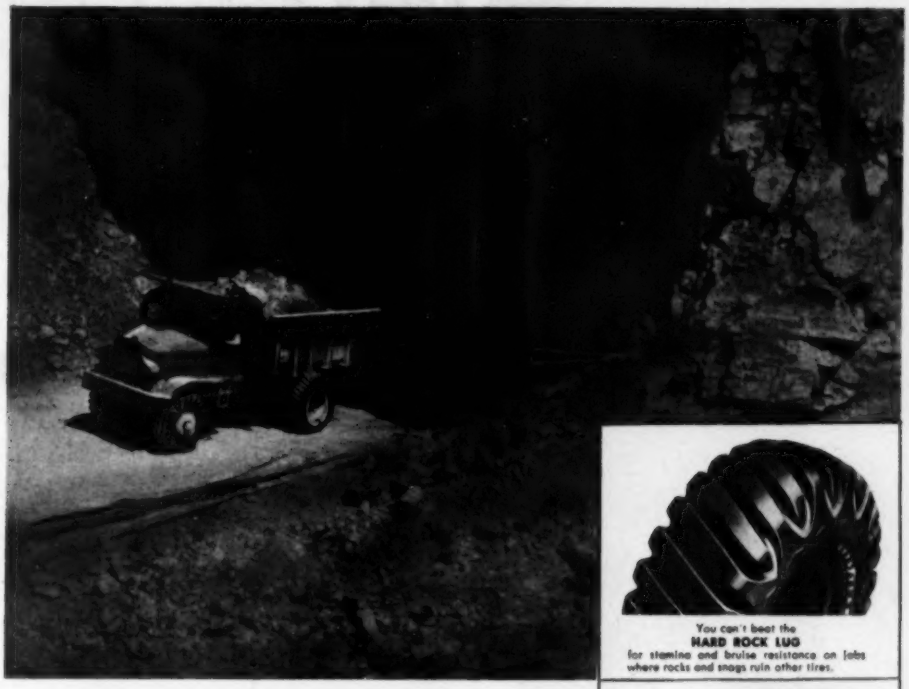
KRAFT BAG CORPORATION

GILMAN PAPER COMPANY SUBSIDIARY
630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.
Plants at Gilman, Vt. & St. Marys, Ga.

gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Gilbound Corp.
• Kraft Bag Corp.

If your product fits into a bag—we'll make the bag to fit your product

THERE GO YOUR PROFITS-



You can't beat the
HARD ROCK LUG
for stamina and bruise resistance on jobs where rocks and snags ruin other tires.

You can't beat the
HARD ROCK RIB
for front wheels on all tire-killing service. Rugged—smooth rolling—easy steering.

You can't beat the
ROAD LUG
for toughness and traction OFF the road and long, smooth mileage ON the road.

AND WHETHER THEY GO into your pocket or out the window can well be decided by how your tires *work* and *stand up* under any and all conditions.

It takes loads of experience to build tires that can handle *any* job, day in, day out—and save you time and money—but Goodyear has what it takes. Goodyear has built over 580 MILLION pneumatic vehicle tires—more tires for more uses than anyone else on earth—and out of that unmatched practical experience come the continuous cost-saving improvements that mean so much to you. So pin your faith on Goodyear tires for every wheel on the job—and see what your equipment can really do!

Goodyear, Truck Tire Department, Akron 16, Ohio.

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

America Needs Better, Safer Roads — Let's Bring Them Up to PAR

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

Brad Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

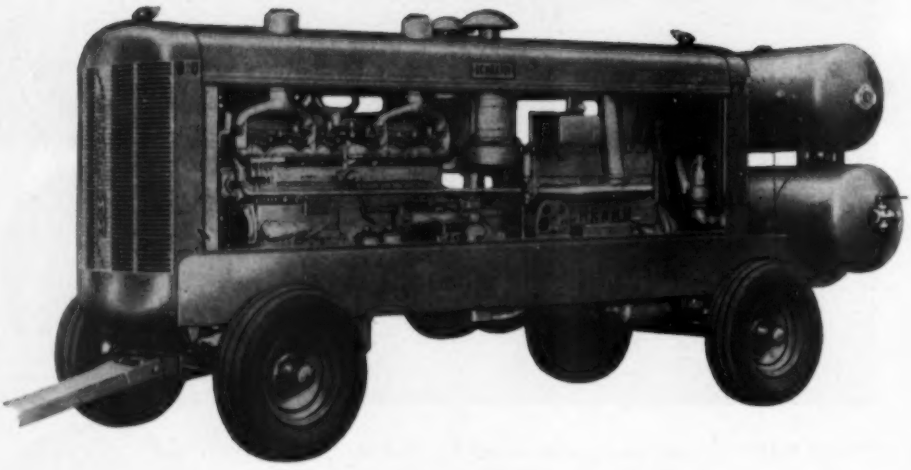
We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

PIT AND QUARRY, May, 1953, Vol. 45, No. 11. Published monthly by Pit and Quarry Publications, Inc., 431 South Dearborn St., Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 50 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

SCHRAMM

MODEL 600

Diesel Engine Driven Air Compressor



Fuel Savings Up To 50%

Pneumastat, simple and rugged . . . Proper Speeds . . . Less horsepower required . . . Cam operated mechanical intake valves, greater volumetric efficiency. There you have some of the many features in the new Schramm Model 600 Air Compressor . . . features that mean economy while supplying you with 600 cubic feet actual air delivery.

SIMPLIFIED DESIGN

You will like its streamlined, simplified design, too—fewer parts . . . watercooled enabling operation with doors closed . . . Dual fan belts . . . Engine and compressor speeds designed to operate at maximum Diesel Engine efficiency.

Don't delay. Write today for Bulletin 5101A on this great, new Model 600 Schramm Air Compressor.

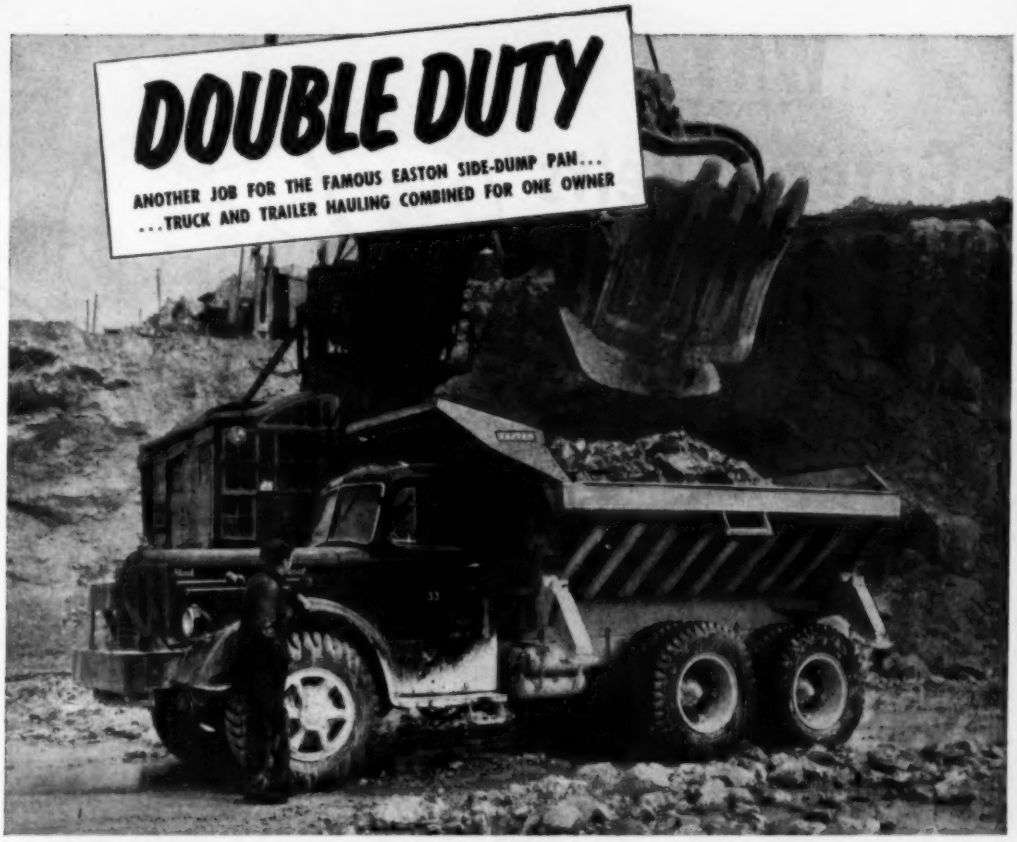
SCHRAMM INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA

DOUBLE DUTY

ANOTHER JOB FOR THE FAMOUS EASTON SIDE-DUMP PAN...
...TRUCK AND TRAILER HAULING COMBINED FOR ONE OWNER



▲ **HERE'S PLENTY OF GO** for any grade — 15 tons in an EASTON BP pan type body mounted on a six-wheel chassis

but only a side-dump can do this

▼ **DOUBLE THE PAYLOAD** — the dump body teamed with an EASTON TP trailer for another haul on the same property

YOU GET LOWEST COST PER TON when your haulage system is custom-fitted to your property. Fortunately, a qualified EASTON haulage survey costs you nothing. Why not take advantage of EASTON's broad experience? Write today.

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

EASTON

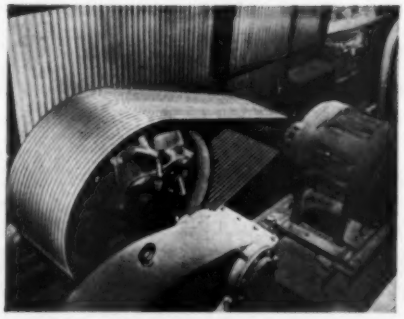
WHY
Gates V-Belts Wear Longer-

The CONCAVE SIDE (U.S. Patent No. 1813698) is what gives the Extra Wear!

Take any *straight-sided* V-Belt (Fig. 1) and bend it as it bends in going around its pulley. You will clearly see its sides *bulge out* (Fig. 1-A). These sides therefore press *unevenly* against the V-pulley and this causes extra wear at the point shown by arrows (Fig. 1-A).

Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2).

You will see the precisely engineered CONCAVE SIDES fill out to an exact fit in the sheave-groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means longer belt *life* and *lower* belt *costs* for you.



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE SIDES—the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

CS-533

V-Belts — Hose
Molded Rubber Goods
for Industry
World's Largest Maker
of V-Belts

Gates® VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

IT'S THE ROCK JOBS

that prove a Shovel!

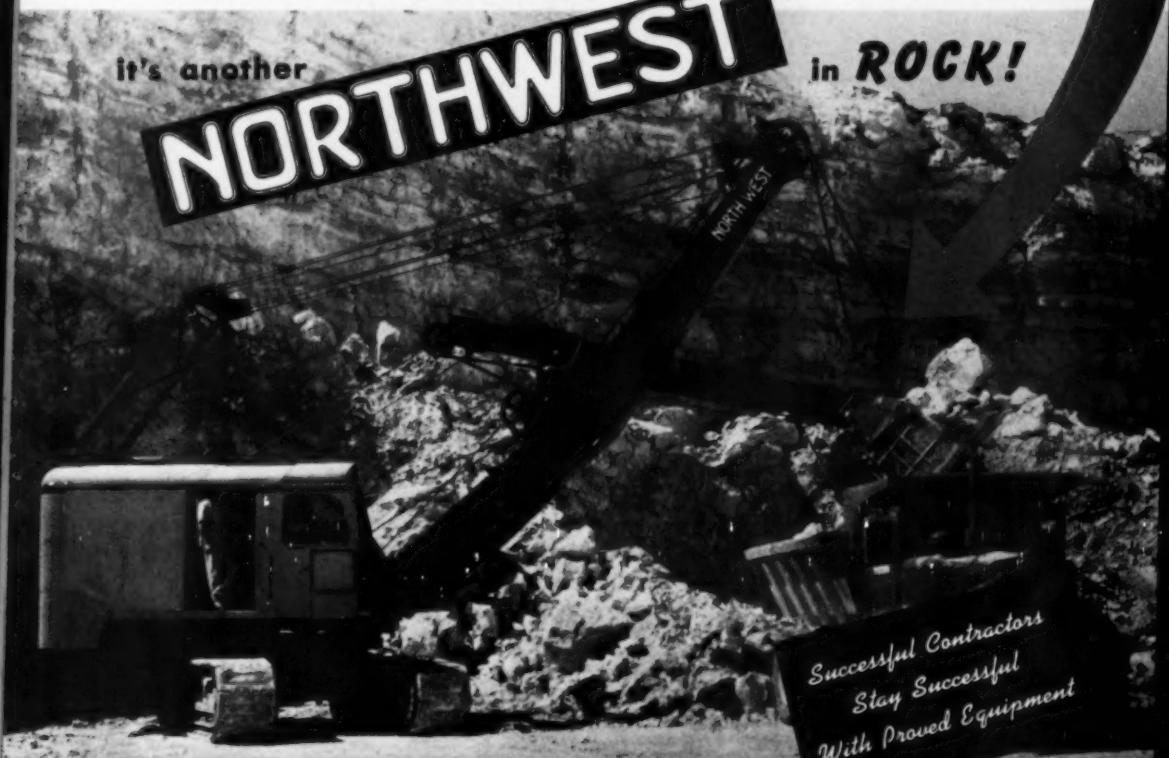
Any shovel can dig dirt! But, put it in rock! Get up on a Northwest if you know "operation". Get the feel of the controls. Feel that crowd take a-hold. The dipper goes right on through as the hoist takes it up — no "re-starts" are required here. It's a full load in one cut. Remember the Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste — force that puts greater effectiveness at the dipper lip for handling tougher digging and producing more output.

To Northwest digging power add the "Feather-Touch" Clutch Control which brings ease of operation without the complications of pumps, piping and compressors; the Cushion Clutch that eliminates shock overloads before the damage is done; Uniform Pressure Swing Clutches that cut spotting time by eliminating the jerks and grabs in swinging; Northwest simplicity of design that makes upkeep easy and reduces "down time"; and all the other Northwest advantages that make Northwest a *real* Rock Shovel.

You can plan to have a Northwest. Now is the time to find out about Northwest design and operation. Why not talk it over with a Northwest man?

NORTHWEST ENGINEERING COMPANY
1515 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

it's another NORTHWEST in ROCK!



Successful Contractors Stay Successful With Proved Equipment

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

"Eucs" haul big loads at less cost

Write for your free copy of the new book "Estimating Production and Costs of Material Movement with Euclids"...it contains helpful information for all users of off-the-highway hauling equipment.

More loads per hour and more profit per load with Euclid equipment on the job . . . that's the experience of many quarry operators, open pit mines, sand and gravel producers, and industrial users of heavy duty off-the-highway hauling units. "Eucs" consistently increase production and reduce the costs per ton or yard of material moved.

Bottom-Dump Euclids are engineered and built as complete units with weight distribution that provides better flotation and traction. With payload capacities up to 40 tons and powered by diesel engines of 190 to 300 h.p., these "Eucs" have loaded top speeds up to 34 m.p.h.

Rear-Dump "Eucs" are job proved for economical hauling of aggregate, rock, overburden and other heavy excavation. Powered by diesel engines of 125 to 400 h.p., they carry payloads of 10 to 40 tons at speeds up to 36 m.p.h.

Owners everywhere report longer service life, greater job availability and more production at less cost with Euclids. See your Euclid Distributor for a detailed job study and Euclid cost estimate for your hauling operation.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

The toughest three-letter word in business

"But . . ."

The word a man uses when he starts by nodding yes and ends by saying no.

"But . . ."

The word on a Multiwall buyer's tongue just after he's said, "Well, as long as we order by specification, I guess one brand's as good as another . . ."

Executives who purchase more than 85 per cent of all Multiwalls have a big BUT there.

They testify* that there are many other considerations. Among the most important, the reputation of the manufacturer. They judge him by his record of reliability, his effort to meet delivery dates, his willingness to give a full measure of service.

We welcome the challenge of the toughest three-letter word in business. We believe the attention big buyers of Multiwalls pay to the *extra* factors—dependability, for instance—has a lot to do with their giving Union a greater proportion of their Multiwall business.

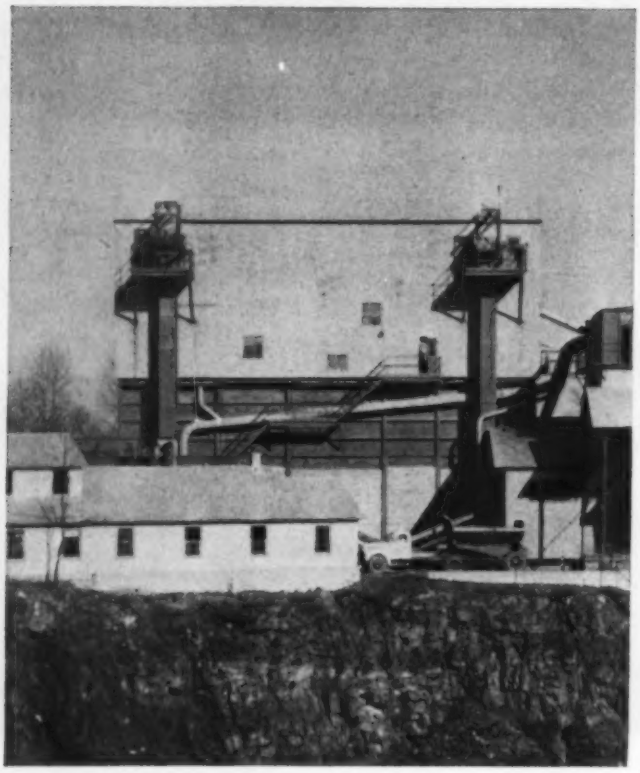
More so every day . . .

IT'S UNION FOR MULTIWALLS

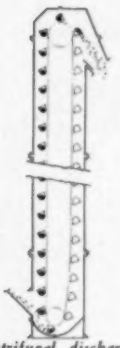
*August, 1951 research study.

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

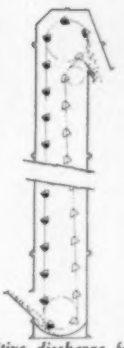
13 types...4 basic designs
to meet your elevating requirements



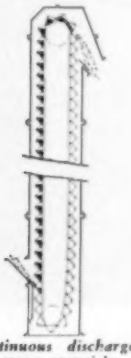
Highly abrasive trap rock is readily handled by these Link-Belt continuous discharge, super-capacity bucket elevators.



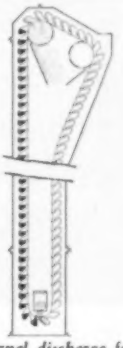
Centrifugal discharge for free-flowing, fine or loose materials with small to medium lumps.



Positive discharge for light, fluffy, fragile or any materials that tend to stick to the buckets.



Continuous discharge for many materials — light to heavy, small to large, abrasive lumps.



Internal discharge for gentle handling of small articles such as pellets, rivets, seeds, castings.

Let LINK-BELT recommend the bucket elevator best suited to your needs

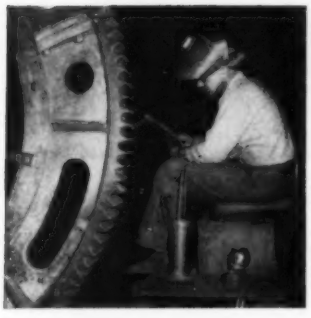
WHERE large or small quantities of bulk materials must be elevated in limited space, a bucket elevator is the equipment you need in most cases. And, in every case, you'll find the one that can do the job for less in the complete Link-Belt line.

Link-Belt builds a type and size of bucket elevator for every requirement. Included in the 4 basic designs are 13 types of bucket elevators designed to suit a variety of materials. A wide range of sizes on chain or belts is also available.

Other Link-Belt engineering extras: Rigid, jig-built casings are self-supporting requiring only occasional lateral tie-ins depending on height. Periodic inspection is speeded with easy access to both head and boot. Chain or belt tension is maintained at all times with simple screw or gravity take-ups. You can get complete engineering information from the Link-Belt office near you.

LINK-BELT
BUCKET ELEVATORS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities. 19,213-D



REXARC

HARD-FACING AND MANGANESE ELECTRODES

Equipment idle or slowed down because of worn-out, broken parts? Down-time eating into profits? Take a tip from Rexarc!

Cost-conscious operators are applying Rexarc at points of wear and impact on all types of earth moving, crushing and abrasive material handling equipment. They're saving thousands of dollars each year in new parts, cutting down-time to a minimum and keeping equipment working longer at bigger profits.

Your welders will like Rexarc's fast build-up and ease of application. And, you'll like its long-wearing quality and economy, too. Because of an all-metallic coating, you get a maximum of deposit. This means Rexarc costs less, regardless of price per pound. Investigate the possibilities today!

Within reach of your plant, repair shop or construction job, there's a Rexarc Distributor ready to serve you. Ask him to demonstrate Rexarc's superior running qualities. He will be glad to help you with your build-up and hard-facing problems, too. If you would like his name, write, wire or call

THE SIGHT FEED GENERATOR COMPANY

WEST ALEXANDRIA, OHIO, U. S. A.

Telsmith Scalper and 13-B Gyratory Crusher
Telsmith Gyrasphere Crusher
Telsmith Vibro-King Sand Screen, Telsmith Super-Scrubber, Telsmith Sand Classifier

Combination GRAVEL AND QUARRY PLANT

for MAY SAND & GRAVEL CO., FORT WAYNE, IND.

ENGINEERED by TELSMITH

TELSMITH Equipment in this Plant

- 4′ x 10′ Single Deck Scalping Screen
- 13-B Gyratory Breaker
- 4′ x 12′ Double Deck Vibro-King Sand Screen
- 84″ x 12′ Super-Scrubber
- 30″ x 25′ Twin Screw Sand Classifier
- 4′ x 12′ Triple Deck Vibro-King Coarse Aggregate Sizing Screen
- 36-S Gyrasphere Crusher

● May Sand & Gravel Co. supplies the Fort Wayne, Indiana area with a variety of aggregate — for state highway use, ready-mix concrete, railroad ballast, etc. This versatile, flexible, combination plant with about 200 tons per hour capacity, was designed by Telsmith engineers to process a sand and gravel deposit located over a workable quarry. Three sizes of stone, and two sizes of sand can be made at the same time. Its 13-B Telsmith Gyratory Breaker and Telsmith 36-S Gyrasphere do all the crushing — now making minus 3½″ plus 2″, minus 1¼″ plus ¼″, and minus ¾″ plus ¼″ gravel and stone. In addition to concrete sand, either mason sand, or bituminous mix sand can be made. ● Telsmith planned plants pay profits. Get Bulletin 266.

GQ-22

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Smgworks, Milwaukee

51 East 42nd St., New York 17, N. Y. • 211 W. Wacker Drive, Chicago 6, Ill. • 713 Commercial Trust Bldg., Philadelphia 2, Pa. • 220 Main Street, Cambridge 42, Mass. • Boebek Eqpt. Co., Milwaukee 3, Wis. • The McLean Co., 3523 Lakeside Ave., Cleveland 14, Ohio

Marcus Eqpt. Co., 432 Main St., Rochester, Mich. • Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Stish Eqpt. Co., Charleston 25, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Interstate Equipment Co., Statesville, N. C.

whys ?

It's wise to know why one line of lubricants will outperform another. Mining men throughout the country have asked and found out why the complete line of Cities Service Lubricants is the wisest choice in terms of dollars and output. Why not talk to one of our Cities Service Lubrication Engineers yourself? Or write Cities Service Oil Company, Dept. EI Sixty Wall Tower, New York City 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

DAVEY COMPRESSORS with Multi-Port Valves

give you more air per gallon of fuel!

Valve Seat

Multi-Port Valve

Valve Seat Disc

Cushion Plate

Spring Plate

Spring Disc

Buffer

Lock Nut

Anchoring Cotter

DAVEY Multi-Port Valve Assembly

Ask any owner of a new **Multi-Port Valve** Davey. He'll tell you that he is getting more air from less fuel than he ever believed possible.

Davey's new **Multi-Port Valves** set new standards of economical compressor operation. In addition, they never carbon or foul . . . do not require replacement, assure constant full air volume, keep tools operating at peak efficiency.

A-1303

Davey Super Chief 600 delivers 600 c. f. m. with minimum fuel consumption. It is lightweight, compact, easy to transport from place-to-place.

DAVEY

pioneers of air-cooled air

Ask your Davey Distributor for data on standard 60 to 600 c.f.m. Davey portable and industrial compressors; "Auto-Air" (truck-mounted) compressors; Mobile Machine Shops and Field Service Units.

DAVEY COMPRESSOR CO. • KENT, OHIO

Eimcos moving earth for fill to build major link in Pan American highway in South America.

MOVING MATERIAL *Fast*

Building levees, highways, for bulldozing, clearing boulders from highways — any job that requires low cost earth or rock moving is best done with Eimcos.

These rugged, heavy-duty loading machines are finding their place in state highway departments, county and municipal road jobs, in sand and gravel pits, in steel mills and among contractors on heavy construction and airport jobs.

Investigate the cost of handling material the Eimco way before you buy.

Above: As a bulldozer. Below: Road building job in Austrian Alps. The shape of the Eimco bucket and the rocker-arm digging action make it possible to pick up and move pieces much larger than with other equipment.

EIMCO

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U.S.A.

BRANCH SALES AND SERVICE OFFICES

NEW YORK, 52 VANDERBILT AVE. • CHICAGO, 2250 SOUTH WALLACE STREET
BIRMINGHAM, ALA., 2180 FAYETTE AVE. • DULUTH, MINN., 210 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF., 837 CEDAR STREET
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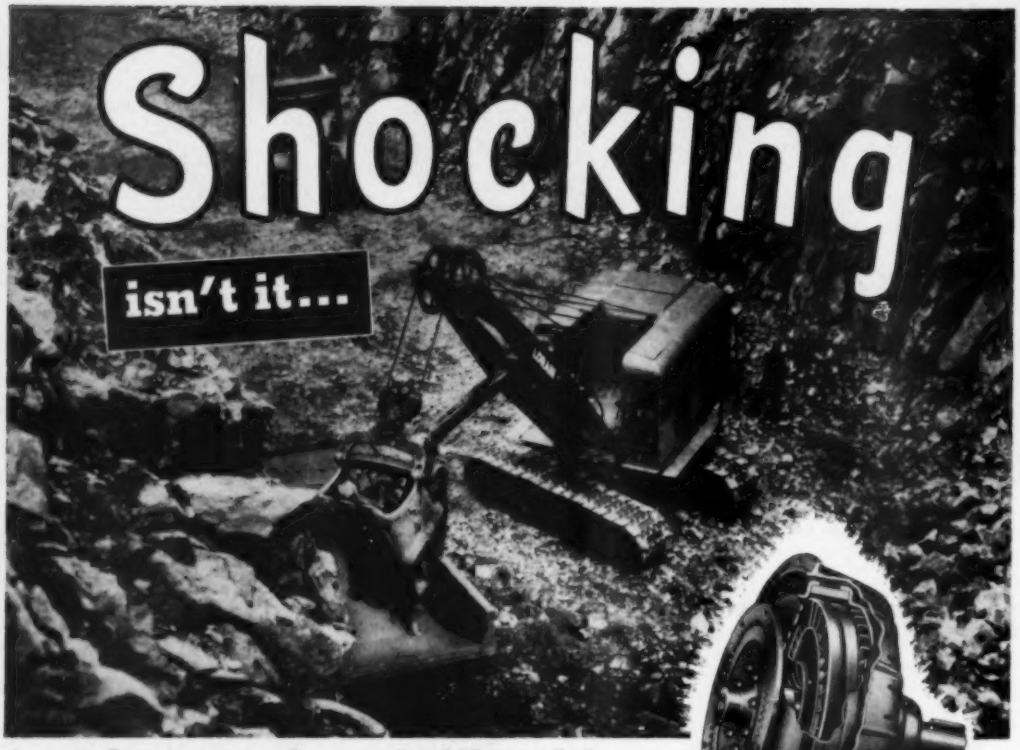
IN FRANCE, SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND, EIMCO (GREAT BRITAIN) LTD., LEEDS 11, ENGLAND
IN ITALY, EIMCO ITALIA S.R.L., MILAN, ITALY

You can't beat an Eimco

Shocking

isn't it...

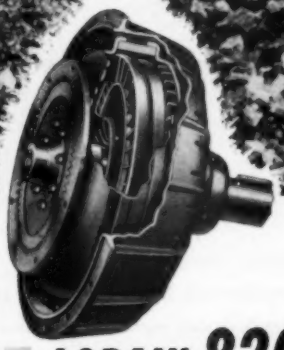


what tough rock like this *used to do* to a shovel?

If you've ever dug rock, you know what it can do to a shovel. But now, there's no excuse for the shocks and impacts of hard rock digging to wear out or break up a shovel before its time. Back in 1940, Thew-Lorain ended all that with the introduction of the Hydraulic (fluid drive) Coupling on the big 2-yd. Lorain-820. Today, it's still the best way to absorb digging shocks and strains—far more effective than any make-and-break mechanical gadget. Shocks and stresses "melt" away before any damage can be done to mechanism or cables. What's more, you can't stall a Lorain-820 engine, either, under any digging circumstances.

The Lorain Hydraulic Coupling is only one big feature that makes the Lorain-820 different and better than any other machine in the 2-yd. class . . . you get this feature as standard equipment. If rock digging is "shocking" to your equipment and costs, ask your nearby Thew-Lorain Distributor to tell you the Lorain-820 story — and show you proof on the job.

THE THEW SHOVEL CO., LORAIN, OHIO



LORAIN 820

Hydraulic Coupling Is Standard

Demand this feature in your next 2-yd. shovel-crane. Whether your machine must take the "shock of rock" or work on the easiest material handling jobs, you'll get s-m-o-o-t-h-e-r, money-saving performance with the Lorain Hydraulic Coupling. Lorain-820's are available on crawler and rubber-tire mountings.

820

THEW LORAIN

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES • HOES

FARRELL -CHEEK

SPROCKETS

✓ WEAR-RESISTANT

✓ ACCURATE

✓ DURABLE

✓ RIGID

Finest Name in Cast Steel!

FARRELL-CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car
R. R. Specialty Castings.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened, Ground.

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.

SPECIALIZED CASTINGS
Light Section Castings

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE
Wire Rope Fittings, Choker Hooks, Bar Benders, Cutters

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

• • • SANDUSKY, OHIO U.S.A.

Substantial savings are realized by cement mill operators using ABK Metal liners in primary, secondary or tertiary compartments for wet or dry grinding of raw stone or finished product.

Extended liner life of as high as 3 or 4 times can be expected when ABK Metal replaces ordinary iron liners. That's because of the extreme hardness (500 to 700 Brinell, as required) and very high resistance to abrasion that is characteristic of every ABK Metal casting. A nickel-chrome iron of controlled structure, ABK Metal is produced only by Brake Shoe.

Why let abrasion steal your operating dollars. Specify ABK Metal castings . . . cut your replacement, maintenance and downtime costs and increase your grinding mills' efficiency.

QUALITY CASTINGS IN | DUCTALLOY | MEEHANITE | ABK METAL

1957 AMERICAN Brake Shoe COMPANY

BRAKE SHOE AND CASTINGS DIVISION
230 Park Avenue, New York 17, N.Y.

A trip through the barking drums is the first step for this southern pine, on its way to becoming pulp at Hudson's giant Florida Multiwall Sack mill. Logs are tumbled until stripped of all bark.

Wood is next reduced to chips like these. Whirling knives devour a 5-foot log in 10 seconds. The mill consumes 700 cords of pine daily.

Digesters 5-story high cook the chips under pressure in a scalding chemical solution. This reduces the wood to pulp.

Here is why HUDSON can guarantee Multiwall Sacks against breaking on the packer

REASON NUMBER 2 HUDSON MAKES ITS OWN PULP

Wood pulp makes up 96 percent of the raw materials for your Multiwall Sacks. By growing its own wood, and manufacturing its own pulp, Hudson exerts iron-clad control of Multiwall Sack quality and delivery schedules. This is another reason why Hudson guarantees to replace *without cost* all Hudson Multiwall Sacks that fail on your packing or closing machines.

After the pulp is washed, beaten, and screened, it looks like this. Note long fibers that give added toughness to Hudson Multiwall kraft.

HUDSON

MULTIWALL SACKS

the World's most fully GUARANTEED

SEND TODAY: How to store your sacks for maximum performance

Profusely illustrated folder shows you the scientific way to store your sacks. Step by step procedures that improve the performance of your sacks by up-to-minute storage methods. No obligation.

MAIL THIS COUPON NOW to Hudson Pulp & Paper Corp., Dept. 105, 505 Park Ave., New York 22, for literature and full information.

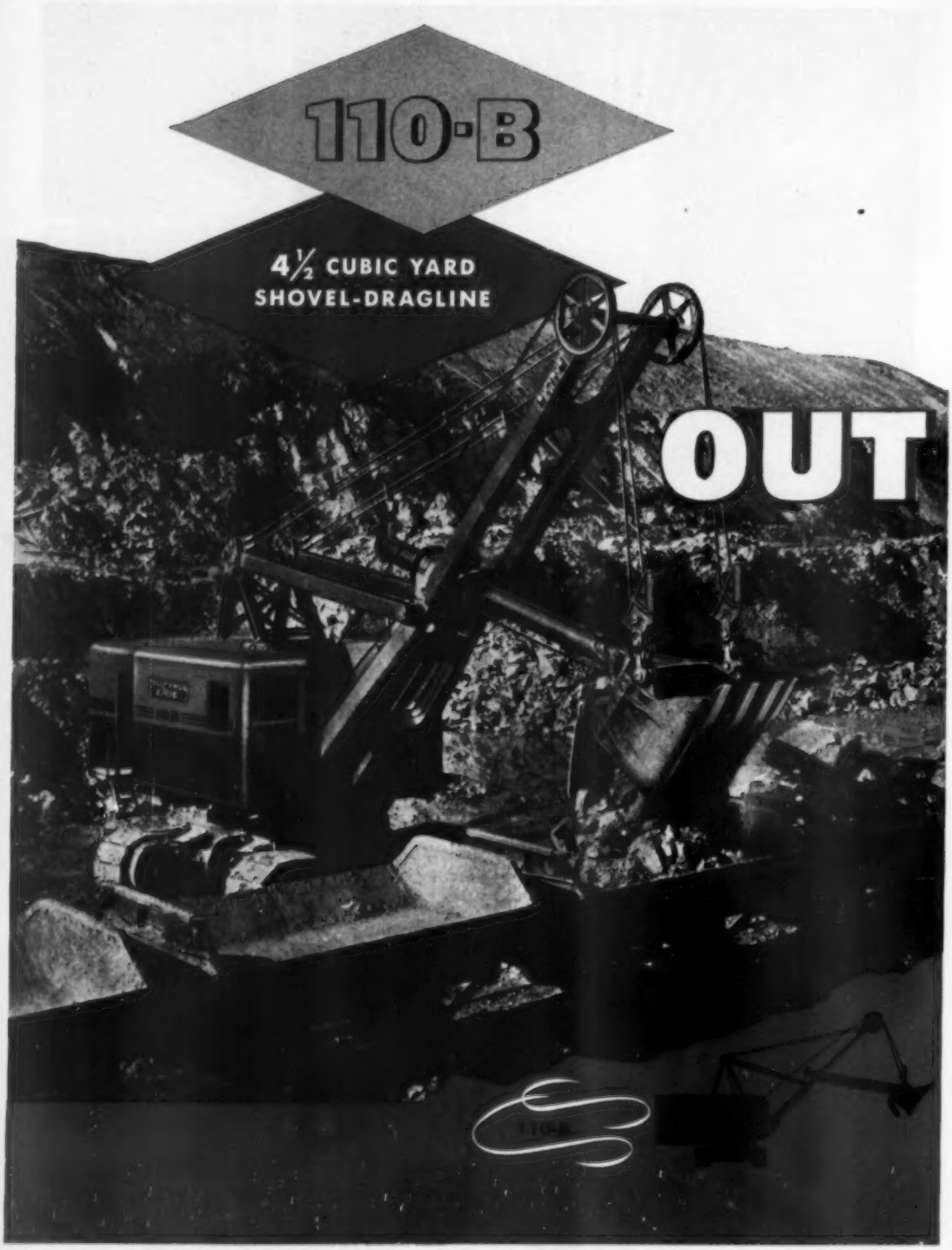
NAME _____

COMPANY _____

STREET _____

CITY _____ ZONE ____ STATE _____

HUDSON PULP & PAPER CORP., Dept. 105, 505 Park Avenue, New York 22, N.Y.


110-B
4½ CUBIC YARD
SHOVEL-DRAGLINE
OUT

another slugger in the PUT lineup

Now — taking its place in the outstanding line of Bucyrus-Erie heavy-duty quarry and mine excavators is the field-proved 4½-yard 110-B — a convertible shovel-dragline which can give you bigger output in rock or overburden at lower cost than any other machine of like capacity on the market today.

Like the larger 150-B (6-yard) and 190-B (8-yard) machines, the 110-B features Bucyrus-Erie's exclusive shovel front-end. The strong, light two-section boom reduces weight and speeds digging cycle, yet provides ample strength for tough digging. Tubular dipper handle, free to rotate in saddle block, permits digging with one corner of dipper without introducing torsional strains. Powerful effective rope crowd reduces swing inertia because crowd machinery is located on revolving frame. And, twin dual hoist ropes concentrate power where needed to pull dipper through toughest banks.

Before you buy any machine in the 4½-yard range, investigate the 110-B. It will give you consistently large output at lowest cost per yard. For detailed information, write today for Bulletin 110-B-1. 7L53C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Another in the great modern line of Bucyrus-Erie quarry and mine excavators — yard for yard, dollar for dollar, pound for pound, the finest ever built.

"Plain Primacord will hug the Plastic in a tight double hitch...

"I use Plastic Reinforced Primacord for unusual wet conditions, and in deep holes, or wherever field shots must stand a long time before blasting. It has a tough, plastic cover and will take a lot of punishment. It is not affected by high summer heat or winter cold.

"I use a trunk line of flexible Plain Primacord and make a double half hitch around the Plastic Reinforced branch line at a right angle, like this. The textile covered Plain Primacord grips securely in a tight double loop around the plastic cover without slipping.

"Tight right-angle Primacord connections all along the line go a long way toward giving you a good shot every time."

Ask your explosives supplier or write for further facts to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut
Also Safety Fuse Since 1836

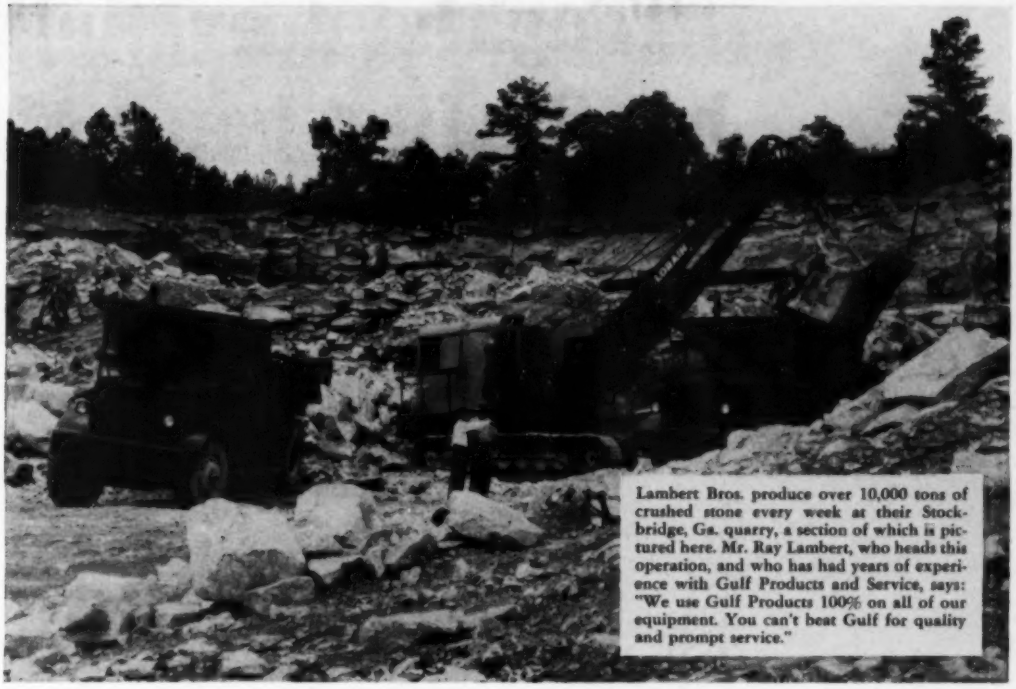
Here **Plastic Reinforced Primacord** is used for the branch line, and **Plain Primacord** for the trunk line. Note the double half hitch around the plastic cover. It pulls up tight and stays that way.

Other brands to serve your needs are: **Reinforced Primacord,** for deep holes and resistance to abrasion; and **Wire Countered Primacord,** for deep, rugged holes.

Use PRIMACORD®

P-3

The PROVED and APPROVED DETONATING FUSE



Lambert Bros. produce over 10,000 tons of crushed stone every week at their Stockbridge, Ga. quarry, a section of which is pictured here. Mr. Ray Lambert, who heads this operation, and who has had years of experience with Gulf Products and Service, says: "We use Gulf Products 100% on all of our equipment. You can't beat Gulf for quality and prompt service."

Gulf Quality Lubricants

keep equipment operating smoothly at Lambert Bros.

Like many other leaders in the industry, Lambert Bros. have found that Gulf petroleum products are tops in quality. They report that this quality is reflected in an extra margin of protection for equipment, fewer delays, lower maintenance costs.

Then, too, they appreciate another extra — the practical benefits from Gulf's excellent engineering service, which provides help on lubrication and combustion problems.

Let us discuss with you how Gulf products and fine service can help your operation. They are available to you through more than 1400 warehouses in 31 states from Maine to New Mexico. Contact your nearest Gulf office.

GULF OIL CORPORATION • GULF REFINING COMPANY
PITTSBURGH 30, PENNSYLVANIA

GULF SERVES INDUSTRY

"Toughest operating but the first batch of

THIS IS A TYPICAL DRILL. It uses a 4-conductor No. 8 Amerclad cable.

Says Chief Electrician, Hudson Plant,
Universal Atlas Cement Company

● Year after year, at this quarry, the Amerclad is exposed to knife-sharp fragments of flying rock. During the summer, the rock often gets so hot that you can't even touch it. Other times, the cable lies out in the rain and snow— often at sub-zero temperatures.

At the Hudson, N. Y. quarry of Universal Atlas, Chief Electrician Frank Rodmond said, "This Amerclad runs the constant danger of being hit with flying rock fragments through secondary blasting. Yet the down-time cost of this operation is so high that we just can't stand cables that keep failing. We kept that last batch of Amerclad 12 years before we replaced it, yet it was still serviceable when we switched over to new Amerclad."

If you want service like this, specify Amerclad the next time you need cable that can really take it. Amerclad is available in a great many sizes and constructions, with or without shielding. There is a type to power anything from a river dredge or mine locomotive down to a rough and tumble electric hand drill. *Send the coupon,* and get more information.

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

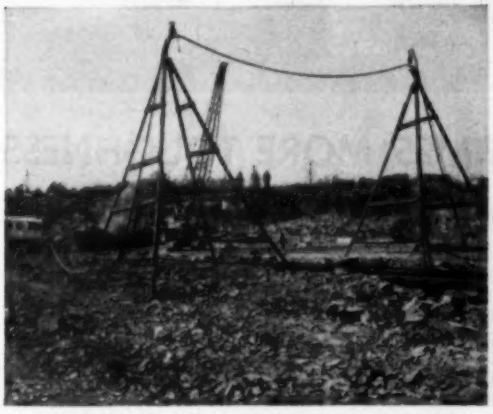
A STANDARD Cable for

- **paper & varnished cambric cable**
- **asbestos wire and cable**
- **aerial, underground & submarine cable**
- **shovel & dredge cable**

U·S·S AMERICAN ELECTRICAL

condition in our quarry— Amerclad lasted 12 years"

NOTICE THE CABLE TRAY fastened to the shovel. This was developed by Universal Atlas for easier cable handling—it also prolongs life of the cable.



HERE A CABLE is raised on horses to clear the railroad track. It feeds the shovel visible in background.

TWO WORKMEN WATCH from blast shelter as charge is set off in distance. Low horses cushion cable from shock of falling rock in secondary blast areas.

every SPECIAL Job!

- mold cured portable cord
- machine tool & building wire
- special purpose wire & cable

WIRE & CABLE

SEND THE COUPON

American Steel & Wire Division
Room GE-53, Rockefeller Building
Cleveland 13, Ohio

☐ Please give me more information about Amerclad.
☐ I'd like to talk to your representative.

Name .....

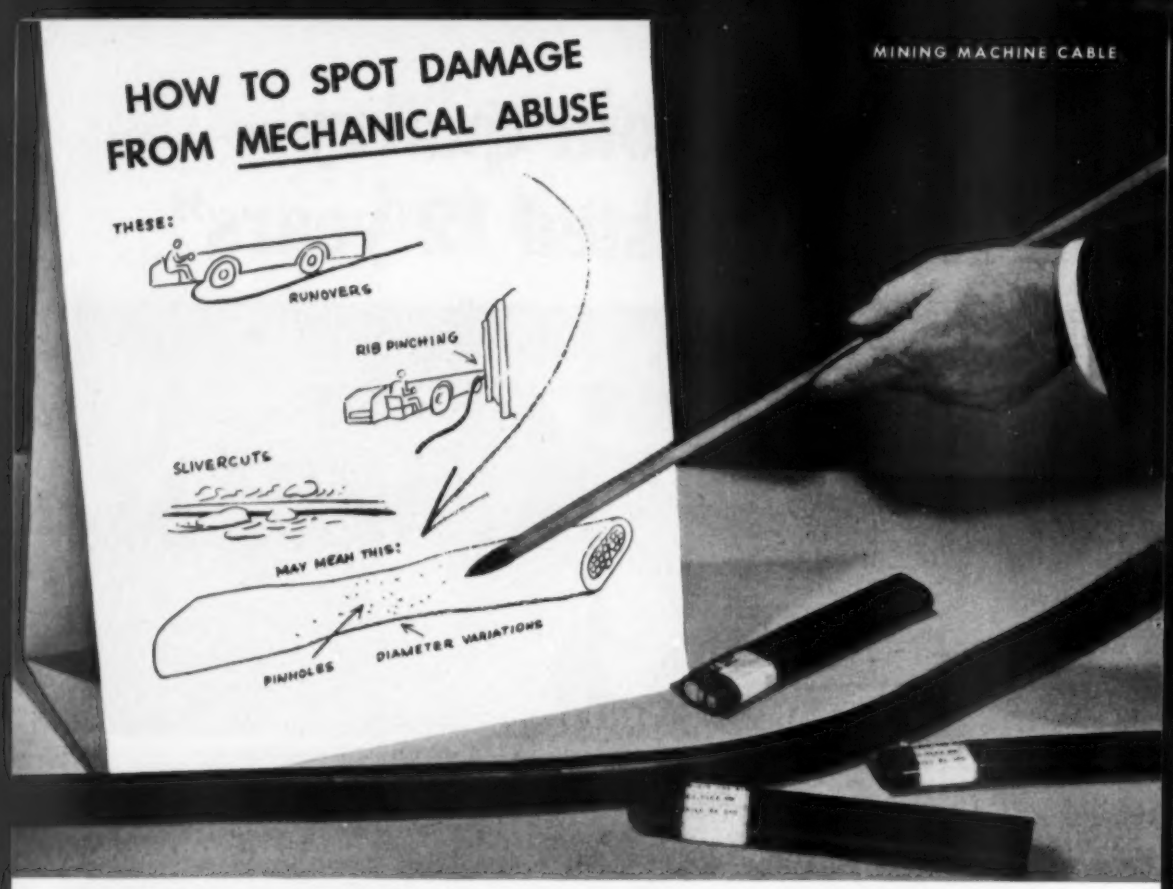
Firm .....

Address .....

City ..... State .....

USS

UNITED STATES STEEL



. . . AND WHY THERE'S 3 TIMES MORE TOUGHNESS IN ANACONDA'S NEW MINING MACHINE CABLE

Your naked eye can't spot diameter differences in new cables. That's why it's important to check promptly when you *do* see variations in cable after it's been used. It has probably been crushed . . . by runovers or rib-pinching. Compression cuts may let in moisture *to shorten cable life.*

HOW TOUGH SHOULD CABLE BE?

As tough as we can make it—regardless of cost. One break in a cheap cable costs more than you can save by buying on price alone. The new ANACONDA Cables mean lower costs to you because they can take 3 times more abuse. In fifteen mines recently surveyed, the average life of ANACONDA Cables on shuttle cars jumped 300% over cables used only a few years ago.

WHY THE NEW ANACONDA CABLES LAST LONGER

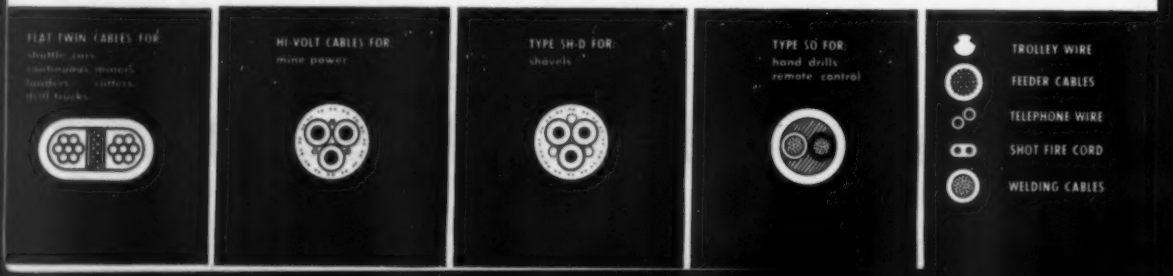
A stronger jacket, made from a new neoprene compound, resists heat, flame and moisture better. In wet mines, sliver-cuts that may cause shocks are less likely to occur. A new cold-rubber insulation means new toughness. Moisture-wise and puncture-wise both. A new type of stranding improves the flexibility of these cables under stress.

YOU BE THE JUDGE

Examine an ANACONDA Cable. See why these things are so. Call your nearest Anaconda Sales Office or Distributor for a sample. And remember: no ANACONDA Cable has ever failed a U. S. Bureau of Mines flame-test. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

ANACONDA®

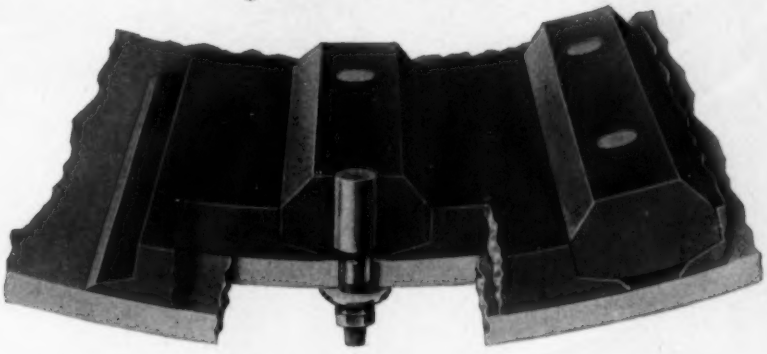
TODAY'S HEADQUARTERS FOR MINE CABLE



When you install

U·S·S LORAIN ROLLED PLATE LININGS

you save



Save on installation time and labor. Lorain Liner Plates are made to accurate size and in easily-handled sections . . . can be installed quickly and easily.

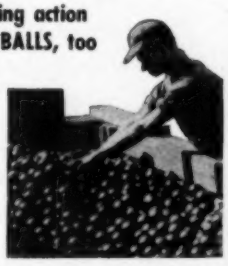
Save valuable grinding space. Because of the strength and resistance to breakage of the rolled steel from which U·S·S Lorain Rolled Plate Linings are made, plates of reduced thickness can be used, thereby increasing the usable diameter of the mill . . . boosting output.

Save on "time out" for repairs. Close fits between ends of plates and between plates and lift bars of U·S·S Lorain Rolled Plate Linings eliminate shell wash and allied troubles which result eventually in costly mill repairs.

Save on replacement materials. Lorain Liner Plates are so rugged they'll wear 'til they're paper thin without failing! And because the plates are interchangeable, severe localized wear at feed or discharge ends of the mill may be balanced just by reversing the worn plates to the opposite end. You get the full life of your linings when they're U·S·S Lorain Rolled Plate Linings!

There are U·S·S Lorain Rolled Plate Linings to fit any type of mill—for wet grinding or dry. Available through leading mill manufacturers whose names will be furnished upon request.

For uniform, efficient grinding action specify U·S·S GRINDING BALLS, too



● For still lower grinding costs and higher grinding efficiency, specify U·S·S Grinding Balls for your mill. They're made to exacting specifications . . . are carefully tested from raw materials to finished product to assure surface hardness and maximum hardness penetration. Available in diameters from ¾" to 5". For further information send for our free booklet on U·S·S Grinding Balls.

United States Steel Corporation
Room 2811-K, 525 William Penn Place
Pittsburgh 30, Pa.

Without obligation on my part, please send me your FREE booklet on U·S·S Grinding Balls.

Name .....

Company .....

Address .....

City ..... State .....

UNITED STATES STEEL CORPORATION, PITTSBURGH, PA • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S LORAIN ROLLED PLATE LININGS AND U·S·S GRINDING BALLS

USS

2-904

UNITED STATES STEEL

For the Best Buy

Hewitt-Robins designs and manufactures a complete line of quality hose—one to meet the particular requirements of every hose application.

Hewitt-Robins Hose has proved its superiority in the field—in case after case, actual performance records prove that it's safer, lasts longer, is more economical.

So for the best buy in hose . . . always see your local Hewitt Rubber Distributor.

HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT

Specify Hewitt-Robins

CHECK FOR INFORMATION ABOUT THESE JOB-TESTED PRODUCTS FOR YOUR OPERATION

CONVEYORS:

- ☐ —Belt
- ☐ —Sectional
- ☐ —Mine
- ☐ —Shuttle
- ☐ —Vibrating

BELTING:

- *☐ —General Conveyor
- *☐ —Raynile®
- *☐ —Elevator
- ☐ —Woven Wire
- ☐ BUCKET ELEVATORS
- ☐ IDLERS

SCREEN CLOTH:

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VIBRATING SCREENS:

- ☐ General
- ☐ Dewaterizers
- ☐ Heavy-Duty Scalpers
- ☐ Slip Lawn

HOSE:

- *☐ Twin-Weld®
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- *☐ Fire
- *☐ Steam
- *☐ Air
- *☐ Water
- *☐ Pinch-Valve
- *☐ Flexible Rubber Pipe
- ☐ MECHANICAL FEEDERS
- ☐ STACKERS
- *☐ GROOVED PULLEY LAGGING
- ☐ SELF-UNLOADING BOATS
- ☐ DESIGN AND CONSTRUCTION OF COMPLETE MATERIALS HANDLING SYSTEMS

*For immediate information about these industrial rubber products, call your Hewitt Rubber Distributor. (See "Rubber Products" Classified Phone Book.)

Hewitt-Robins Incorporated
666 Glenbrook Road
Stamford, Connecticut

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TITLE & COMPANY _____

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SH3

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DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • EXPORT DEPARTMENT: New York City.

"QUICK-WAY"

Reg. U.S. Pat. Off.

THE PIONEER TRUCK SHOVEL

has maintained World-wide

LEADERSHIP

Year After Year for 34 Years

Proven Design—*"QUICK-WAY"* from the very start has been built simple and extra rugged—each part made of the finest steel to carry a big extra margin of strength. Constant improvement in design application and engineering has made *"QUICK-WAY"* better year after year—a machine that *lasts longer,* with *less down time and more profits for the user.*

4 Models—In *"QUICK-WAY"* you have your choice of four models. Model L—1/2 cubic yard, 10 ton crane. Model E—4/10 cubic yard, 7-1/2 ton crane. Model S—1/3 cubic yard, 5 ton crane. Model J—1/4 cubic yard, 3 ton crane. For Standard Trucks and Special Carriers.

Two Hoists—One Boom—For erecting steel, installing heavy machinery, or any other work requiring the utmost accuracy, the *"QUICK-WAY"* Power Down, Worm Gear Drive, Boom Hoist gives the operator full power control of the load, either up or down to within a fraction of an inch. This installation does not affect the standard live Boom Hoist. This gives two different Boom Hoists at the operator's finger tips at all times.

All Steel Construction—Full use of the toughest alloy steels gives correct balance and weight distribution of essential working parts, puts strength where needed with minimum bulk. Because of their high capacity to weight ratio, rugged construction, fast mobility, big capacities and low maintenance costs, *"QUICK-WAYS"* have no equal. Ask your distributor today for a free demonstration.

With Many More Money Making Attachments and Special Tools

"QUICK-WAY" Truck Shovel Co., Denver, Colo., U.S.A.

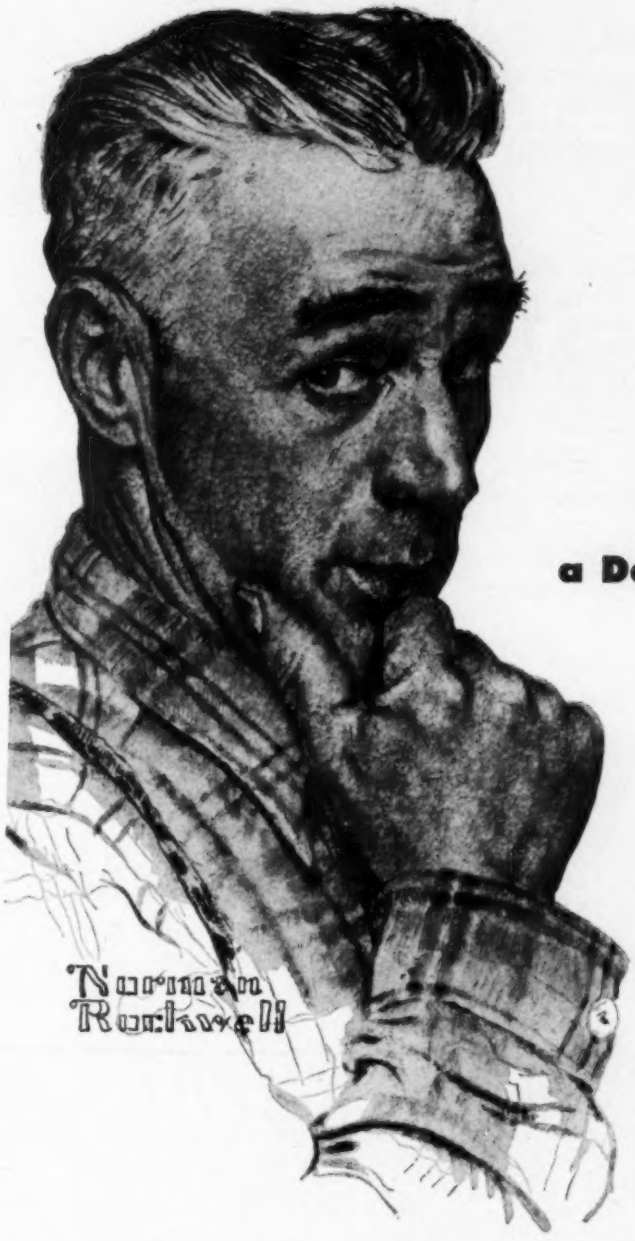
"QUICK-WAY" TRUCK SHOVEL CO. *Mail Coupon Today!*
Dept. 135 • 2401 East 40th Ave.
Denver, Colorado • U.S.A.

Please send NEW 28 page, two color FREE book giving complete details on all four "QUICK-WAY" Models.

Name _____

Address _____

City _____ *State* _____



You?...

a Doubting Thomas?

IF YOU'RE a man who has to be shown, we're right in your corner. Just give Roebling "Blue Center" Steel Wire Rope one try... see for yourself how it saves time and costs you less on the job.

Two out of three wire rope users in the quarries prefer Roebling rope. Call your nearest Roebling office for a Field Man to suggest the best ropes for your particular purposes.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 330 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE TRENTON 2, N. J.

Here's the Machine for LO

Be fair with yourself. Does your present loading method really give you the lowest cost for loading trucks?

Does it operate continuously, or does it depend on the zeal and skill of the operator?

Does it tie up your trucks unnecessarily during the loading operation? Or does it release them as rapidly as possible?

Remember your trucks are paying off only when they are hauling.

They don't pay you one dime while they are waiting to be loaded. In fact every idle second costs you money.

The Barber-Greene Model 543 Bucket Loader was designed to save loading time, truck time, and job time.

The Barber-Greene Bucket Loader is easily converted to a Cast or Load Loader. Quickly maneuvers to right, center or left on the side or over the top of the truck bed.

If poor loading conditions are your loading problem, the B-G Model 824 is the answer. Its crawler-mounted traction enables it to load from stock pile, windrow or bank with speed ease.

see your **B-G distributor** ...or write

W-COST LOADING

Here is a picture of a man making money. He has eliminated unnecessary loading costs and truck delays. For complete information on the Barber-Greene Loader, contact your B-G distributor or write Barber-Greene Company, Aurora, Illinois.

Handling costs are a part of your material costs. To keep your material cost down, use the proven, most economical way of loading trucks. Only a B-G Loader has so many outstanding exclusive features.

The hydraulically-controlled telescoping conveyor pays for itself many times over in time saved. One truck backs under while the other is being loaded. There is virtually no lost time between trucks.

Barber-Greene

Aurora, Illinois, U. S. A.

P&H STABILITY

makes a big difference!

When you need that extra push, you'll be glad your machine is a P&H. With its low center of gravity, better balance and all-welded construction of rolled alloy steels — you can exert more power at the tooth point with less strain or danger of tipping. That's what gives you the *added work capacity*. You can prove this for yourself as many others have done. Ask to see a P&H on a job near you. Watch it work!

And while you're there, watch the mobility on true tractor-type crawlers. Note how smooth hydraulic control enables the operator to "feel" the load at all times. It's easier on both man and machine. And far easier on maintenance. You'll sell yourself on P&H in a hurry.

P&H POWER SHOVEL AND CRANE DIVISION

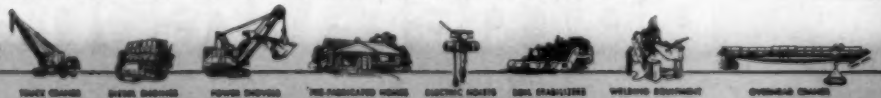
HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

See your P&H Dealer!

Look to P&H for the most modern features in Power Shovel and Truck Crane construction. There's all-welded design, live roller circle, triple-safe boom hoist, hydraulic control, plus a low center of gravity that provides a higher ratio of lifting capacity to gross weight. This means more WORKABILITY . . . BETTER PERFORMANCE . . . GREATER SAFETY. Write for literature on the size you need.

the P&H *Line*



Now available!
Superior insulation featured in new Cyanamid blasting caps

AMERICAN CYANAMID COMPANY
EXPLOSIVES

Cyanamid has for many years been conducting a study of all materials available for blasting cap wire insulation to find one that would offer uniform concentricity—no thin spots. Every type of insulation currently in use has been tested, as have many new materials. Now Cyanamid has an insulation that gives *uniform concentricity*, assures maximum performance!

This new, organisol plastic insulation is applied to wire by a continuous bath method. The wire is dipped in *seven separate baths* and is passed through dies to scrape off excess coating between baths.

Color-Coded for Easy, Sure Identification

Instantaneous, copper wire | Instantaneous, iron wire | Standard Delay | Split Second Delay

Each coat is heated to insure perfect set, perfect concentricity. Organisol plastic insulation, because of its uniformity, gives you:

1. **Greater electrical insulation values**
2. **Greater flexibility**
3. **Greater abrasion resistance**
4. **Non-porosity**
5. **Greater moisture resistance**

Capable Field Engineers Are Available At Your Call

HIGH EXPLOSIVES • PERMISSIBLES • BLASTING POWDER
BLASTING ACCESSORIES

AMERICAN Cyanamid COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.
Sales Offices: Pittsburgh, Pa.; Bluefield, W. Va.; Scranton, Pa.; Chicago, Ill.; Pottsville, Pa.; Maynard, Mass.

SNAPPY swing
QUICK control
EASY operation
FINE balance

add up to accurate spotting of buckets with a BAY CITY

Whether you are loading bins and trucks or dumping on a spoil bank, the balanced design and easy flow of power of a BAY CITY will speed your materials handling and excavating operations . . . increase your profit possibilities.

With shovel, dragline or clamshell, the snappy swing, quick control, easy operation and fine balance of a BAY CITY make it easy to spot the bucket accurately and speed the digging cycle. No single factor makes the BAY CITY so long-wearing . . . so long lasting. It is a combination of heavy-duty design, construction and operating features which have made so many BAY CITY owners *repeat buyers* for up to 35 years. See your BAY CITY dealer for the full story or write today for catalog.

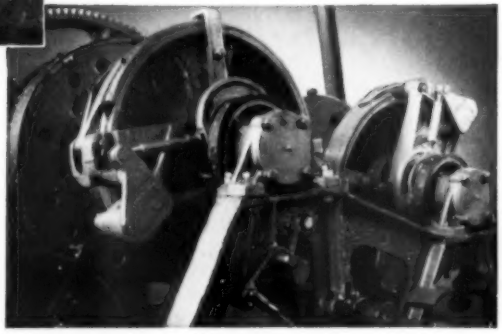
BAY CITY SHOVELS, INC.
BAY CITY, MICHIGAN

CHECK THESE FEATURES

- √ Fully Convertible
- √ Long, Wide Crawlers
- √ Alloy Cast Bases
- √ Tandem Drums
- √ Power Booster Clutches
- √ High Line Speeds
- √ Wide Vision Cab
- √ Pin-Connected Boom

209

Power booster clutches—single adjustment ▶



BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

GOT A TOUGH NUT TO CRACK?

Chances are your Socony-Vacuum Representative can help you!

Every so often—even in the best of fleets—a tough mechanical problem develops, one that seems to defy solution. It may be bearings going bad without apparent reason or engines suddenly becoming fuel and oil burners. But whatever the problem, you'll find your Socony-Vacuum Representative a mighty helpful friend.

In seeking the solution to your problem, he can draw on Socony-Vacuum's 87 years of experience, its vast research facilities, its staff of lubrication engineers—largest in the industry. He'll give you individual lubrication schedules—advice on correct application of lubricants—recommend the *right* lubricant for every part of every machine.

So, if a problem has *you* stumped, don't wait—call in your Socony-Vacuum Representative.

SOCONY-VACUUM

CORRECT LUBRICATION *for Contractors*

WORLD'S GREATEST LUBRICATION KNOWLEDGE AND ENGINEERING SERVICE

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC., MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

Your Management wants to know...

How valuable dust recovery automatically boosts production

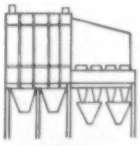
Nineteen years ago, our engineers developed what we think is the most workable way of solving the Dust Recovery problem. It was the formation of "dust recovery teams", consisting of Buell engineers and the plant engineer—the man who knows his particular dust problem better than anyone else.

This team, drawing on the experience and background of Buell, coupled with the plant engineers' intimate knowledge of his own problem, brought about the kind of results industry has been seeking: substantial profit increase, improved product and/or process, better employee morale.

To learn more about Buell's **3 basic systems** of Dust Collection, Buell's Plant-Engineer-Team-Up, and how they can work for you—send for the new informative booklet entitled, "The Collection and Recovery of Industrial Dusts". Buell Engineering Co., Dept. 18-E, 70 Pine Street, New York 5, N. Y.

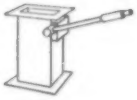
VAN TONGEREN CYCLONE

'SF' ELECTRIC PRECIPITATOR



PRECIPITATOR—CYCLONE COMBINATION

TYPE 'LR' COLLECTOR



DUST HOPPER VALVES

ELECTRIC CYCLONIC

buell

ENGINEERED EFFICIENCY IN DUST RECOVERY

ALONE IN ITS CLASS for TOP CAPACITY!

THE UNIVERSAL 880 SENIOR "R"

BIG 4'x12' SCREEN

Full 48 square feet of screening area and inclined mounting for top capacity.

BIG 1036 JAW CRUSHER

Famous Universal overhead eccentric force feed action and design for top capacity.

FIELD PROVED AND PORTABLE

Operators report tremendous capacities . . . fast and easy moves and setups. It's designed to meet state weight restrictions.

BIG 3024 ROLL CRUSHER

Roller bearing star gear drive. Designed to use its full 24" width for top capacity.

BIG 30" CONVEYORS

Top capacity loads handled easily.

Before you buy get full details on the new, advanced design Senior "R" Gravelmaster. See your Universal distributor or write for literature.

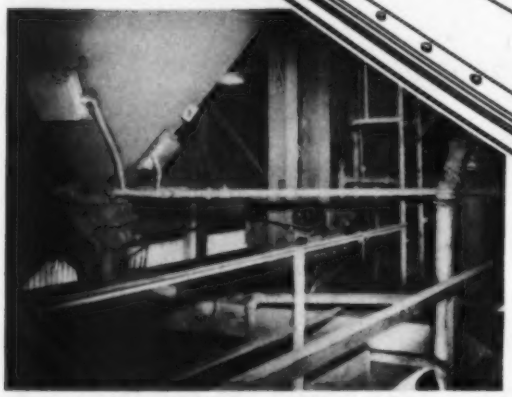
UNIVERSAL ENGINEERING CORPORATION *Subsidiary of* **PETTIBONE MULLIKEN CORPORATION**

619 C Avenue N.W., Cedar Rapids, Iowa
Phone 7105

4700 West Division St., Chicago 51, Illinois
Phone Spaulding 2-9300

Pulverized materials flow like water!

View of one of three Airslides conveying from three bins to a main cross Airslide.



Partial view of four Airslides conveying from four bins; shows F-H Airfeeder and Airslide underneath bin, left. Fuller Aeration Units in cone of bin, for aeration and prevention of arching. Blowers, furnishing air for Airslides and aeration units, in background, center.

F-H AIRSLIDE® CONVEYOR

For sheer simplicity, low-maintenance costs and ease of operation, the F-H Airslide Conveyor is just about tops. In this system, dry, fine materials like gypsum, soda ash, fly ash, cement, barytes, flour, alumina, silica, talc, resins, detergents and soap powders are aerated and made to flow like water. Low-pressure air is dispersed through the material from a porous medium so that each particle is enveloped in air, thus reducing the interparticle friction and the angle of repose. Hence the material flows.

Think what this means to you? Because the system is completely enclosed, danger of contamination is removed . . . dusting eliminated. No moving parts, consequently repairs and costly down-time is at the minimum. Easily erected, a space-saver, the Airslide permits economy and convenience in location without the restrictions or straight-line limitations of mechanical conveyors.

Why not have a Fuller engineer show you how the Airslide can help cut your conveying costs . . . modernize your present plant equipment, or plan an entirely new system. Chances are he can show you how a minimum expenditure can bring you a conveying system that means low cost, reliable operation.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS · COMPRESSORS AND VACUUM PUMPS · FEEDERS AND ASSOCIATED EQUIPMENT

FULLER COMPANY, Catasauqua, Pa.
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

Fuller Company is the exclusive manufacturer of air gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U. S. Patent Nos. 2,316,814, 2,517,837, 2,527,394, 2,527,455, 2,527,466, 2,527,488 and Patents Pending.

FM-28

NOW! Completely new FORD TRUCKS for '53

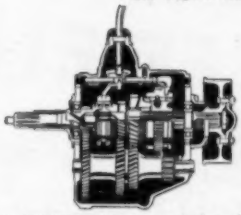
Scores of brand-new, TIME-SAVING features in the completely new Ford Trucks for '53 add a new dimension to truck economy. And you can choose from over 190 models in a greatly expanded line.

Ford Trucks are leaders in *low first cost* and *low running costs*. They last longer for *low ownership* costs. Now for '53, new TIME-SAVING features cut trucking costs still further.

NEW 6½-FT. PICKUP box has new rigid, clamp-tight tailgate.

NEW "DRIVERIZED" CABS cut driver fatigue! One-piece curved windshield 55% bigger. I-REST tinted glass (extra cost). Wider seat with counter-shock seat snubber.

Deluxe cab shown in all illustrations



NEW SYNCHRO-SILENT transmissions for easier shifting—no "double clutching"—standard all models. New *Fordomatic* or Overdrive on F-100 at extra cost.

NEW LOW-FRICTION POWER in 3 overhead-valve engines—*Cost Clipper* Six, *Cargo King* V-8's. Five engines in all with famous Truck V-8 and Big Six.

NEW SHORT TURNING for better maneuverability. New wider tread gives 37° steering angle. New set-back axles shorten wheelbase, improve weight distribution without reducing capacity.

NEW SPRINGS! NEW BRAKES! Longer front and rear springs for easier ride, longer life! New self-energizing brakes for better control . . . double-cylinder type, rear, on Series 500 and 600.

Parallel frame rails for better service accessibility
New banjo-type hypoid rear axle
New steering geometry
New wider tread, set-back front axle

NEW TIME-SAVING FEATURES THROUGHOUT! All new . . . all the way! New fast controls and new power save truck time on the road . . . New service accessibility saves truck time in the shop.

BIGGEST FORD TRUCK ever built—new Ford Series F-900 has G.C.W. rating of 55,000 lbs. as a tractor and G.V.W. truck rating of 27,000 lbs.

Designed for today's hauling needs!

FORD *ECONOMY* TRUCKS

SAVE TIME! • SAVE MONEY! • LAST LONGER!

Good Drivers Drive Safe Trucks

FREE! MAIL THIS COUPON NOW!

FORD Division of FORD MOTOR COMPANY
P.O. Box 658, Dearborn, Michigan

Please send me without charge or obligation, complete details on new Ford *Economy* Trucks for '53!

FULL LINE ☐ HEAVY-DUTY MODELS ☐
LIGHT MODELS ☐ BIG JOB MODELS ☐
PARCEL DELIVERY ☐ CAB FORWARD MODELS ☐

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TRADEMARK REG.

COPPER-MOLYBDENUM-ALLOY

Grinding Balls

Used and Proved All Around the World

Measure the price of your grinding balls in terms of highest possible production and the lowest cost per ton of material ground

Do this and you will join the ranks of mines, mills and cement plants, including some of the world's largest concentrators, who have standardized on Moly-Cop balls.

The Sheffield alloy, hot rolled, hot forged, slow cooled, reheated, sized and quenched—all by means of automatically controlled equipment—produces fine-grained, harder, tougher balls that wear longer and hold their spherical shape longer.

You benefit from lower ball costs per ton milled, fewer chargings, less handling and down time, greater grinding efficiency and reduced mill power consumption.

Sheffield engineers stand ready to prove the money savings advantages in your operation.

SHEFFIELD STEEL CORPORATION

HOUSTON KANSAS CITY TULSA

SUBSIDIARY OF ARMCO STEEL CORPORATION

Export Representatives: ARMCO INTERNATIONAL CORPORATION, MIDDLETOWN, OHIO

when the going's like this ...make it *all* GARDNER-DENVER

Gardner-Denver Portables for dependability, without pampering.

Gardner-Denver Wagon Drills for quick spotting and fast drilling.

Gardner-Denver Sinkers for power and more power in every weight class.

Send for descriptive bulletins.

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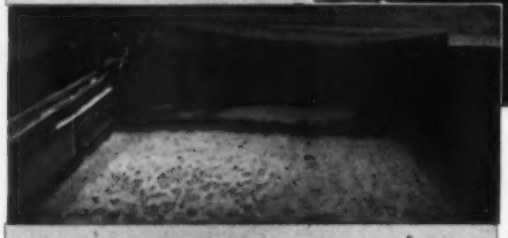
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

No Blinding!

...SCREENING MOIST PULVERIZED LIMESTONE

THERMO-DECK Heating Unit

No blinding on this *Ripl-Flo* screen handling moist limestone.



This is what happened on the same screen when we turned the *Thermo-Deck* heating unit off for half an hour.

Thermo-Deck heating units can be applied to your Allis-Chalmers screens in the field. For more facts, call the A-C representative in your area or write for Bulletin 07B7812. Allis-Chalmers, Milwaukee 1, Wisconsin.

SCREENS MOIST, FINE MATERIALS . . . with no "time out" to clear the screen cloth. Low voltage resistance heating keeps screen mesh free of blinding.

HEATED CLOTH LASTS 3 TIMES AS LONG! Clear screen cloth carries less weight than blinded cloth; has less tendency to whip. Damage resulting from pounding or brushing is greatly reduced.

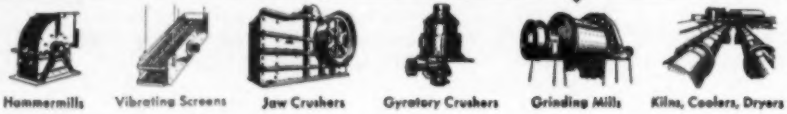
SCREENING CAPACITY INCREASED 2 WAYS! More tonnage goes through the screen when cloth *remains* open. And, with no downtime to clear the screen, more tonnage goes through per day. A-3935

Thermo-Deck and *Ripl-Flo* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

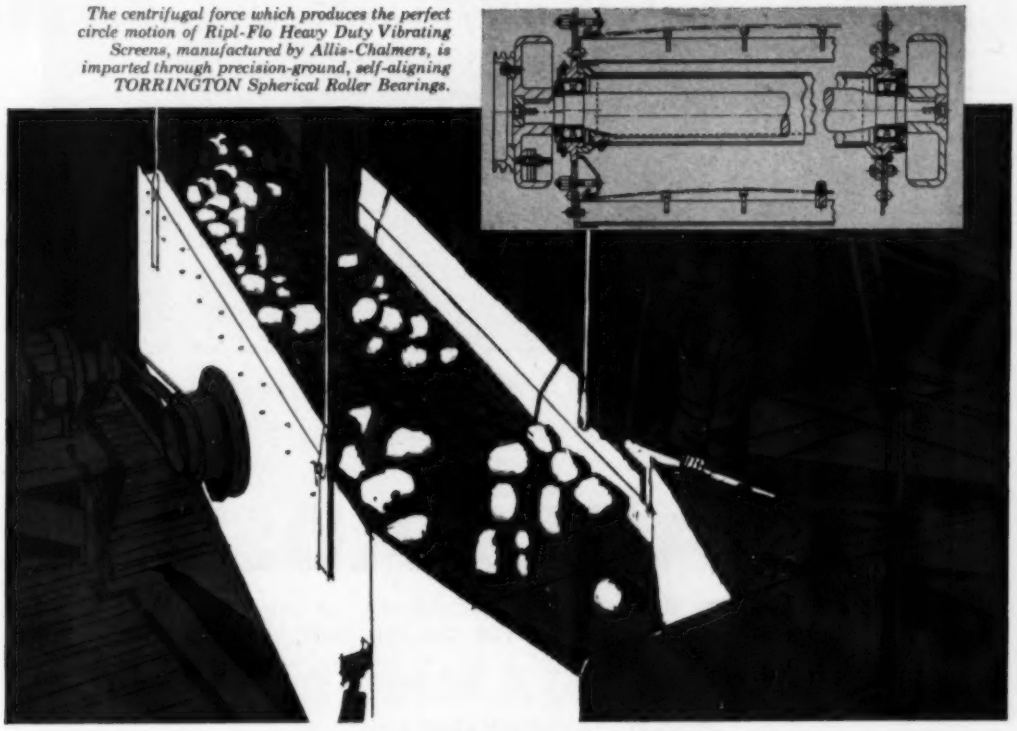
A-C ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

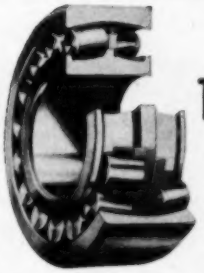


Hammermills | Vibrating Screens | Jaw Crushers | Gyratory Crushers | Grinding Mills | Kilns, Coolers, Dryers

The centrifugal force which produces the perfect circle motion of Ripl-Flo Heavy Duty Vibrating Screens, manufactured by Allis-Chalmers, is imparted through precision-ground, self-aligning TORRINGTON Spherical Roller Bearings.



Solving toughest bearing problems!



Tough bearing problems are encountered in the design of heavy-duty vibrating screens. Leading builders have found the answer in TORRINGTON Spherical Roller Bearings.

Self-aligning, these rugged TORRINGTON Bearings compensate for minimum shaft deflection. Bearing capacity remains constantly at peak value. Bearing wear is greatly reduced.

Precision-ground from heat-treated high-alloy steels, TORRINGTON Spherical Roller Bearings cut friction to a practical minimum. Power flows smoothly and efficiently on high conformity surfaces. Bearing life is lengthened and daily tonnages climb.

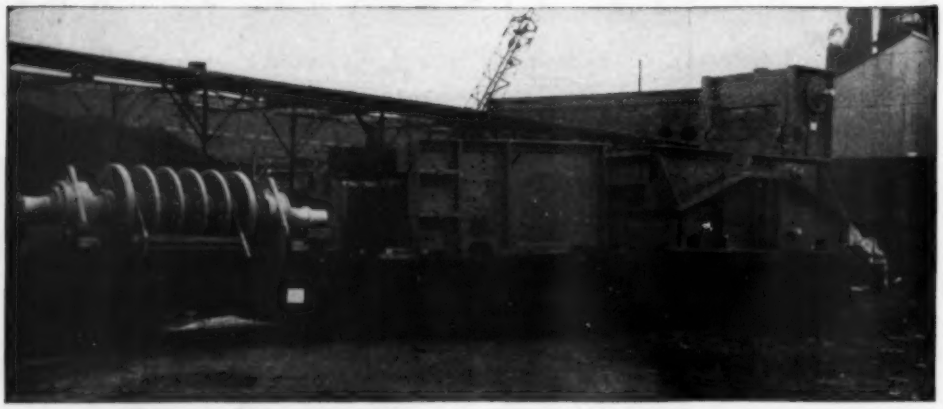
Features like these solve the toughest bearing problems not only in vibrating screens but also in pulverizers, grinding mills, crushers and rotary kilns.

Always use TORRINGTON Spherical Roller Bearings!

THE TORRINGTON COMPANY
South Bend 21, Ind. Torrington, Conn.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers



ONE STAGE BULLDOG HAMMERMILL

NON-CLOG MOVING BREAKER PLATE

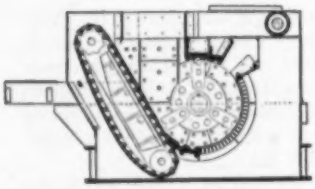
CAR LOADS

[PARTIAL SHIPMENT FOR ONE CUSTOMER]

BULLDOG HAMMERMILLS

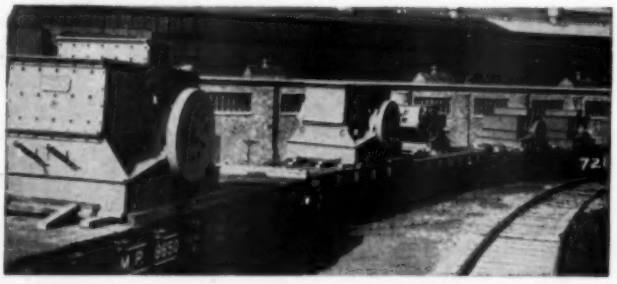
[PRIMARY - SECONDARY - FINE REDUCTION]

BULLDOG HAMMERMILLS for DRY OR WET STICKY MATERIALS FOR THOSE TOUGH HEAVY-DUTY CRUSHING JOBS 1 to 1000 ton capacity



Ask for List of Installations

ASK FOR LIST OF INSTALLATIONS



We will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

HAMMERMILLS, INC.
4766 W. Division St.
Chicago 51, Illinois

division of

PETTIBONE MULLIKEN CORP.
Phone SPaulding 2-9300

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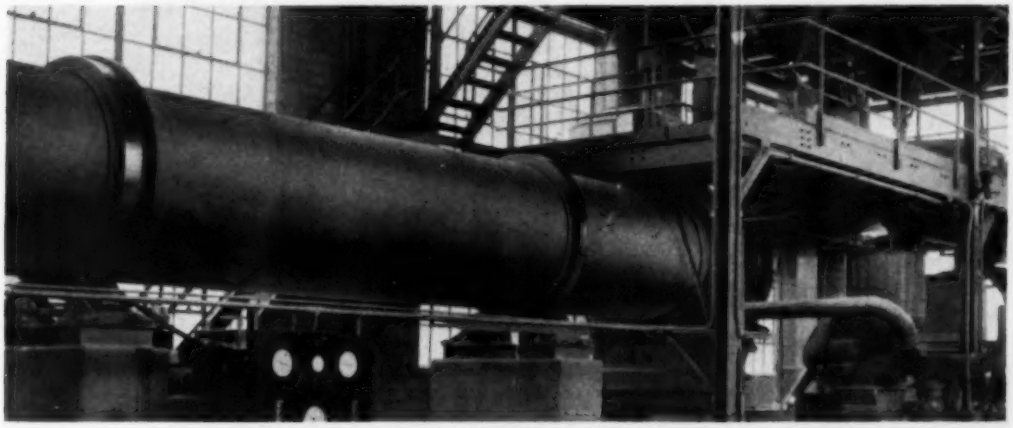
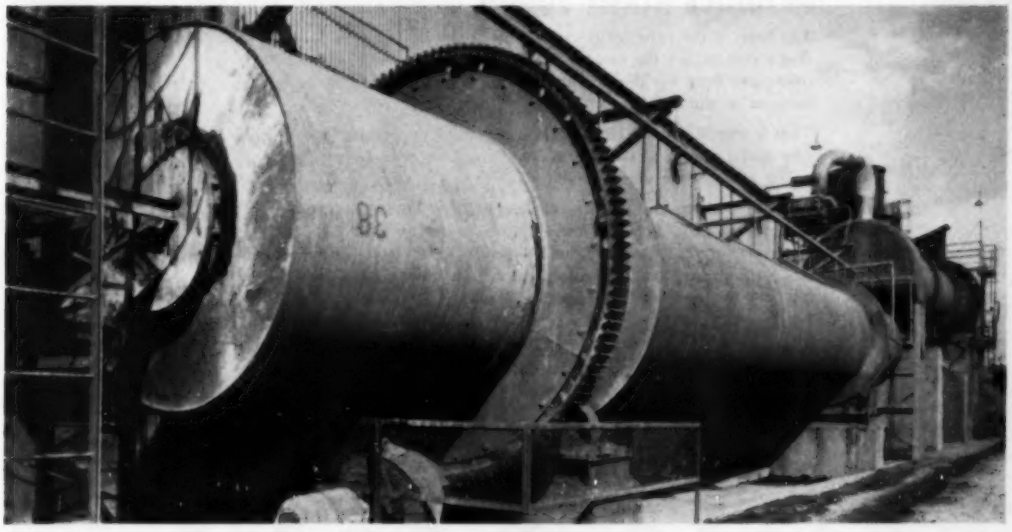
Dryer Sales Offices: 139 South Fourth Street, Louisville 2, Kentucky
OFFICES IN ALL PRINCIPAL CITIES



GENERAL AMERICAN LOUISVILLE DRYERS

The Steam Tube, Indirect Steam, Direct Heat, Type "L" (Semi-Indirect Heat) and Indirect Direct Heat types are in successful operation in ore-concentrating and smelting plants, drying both shaker-table and flotation concentrates — particularly in connection with electro-static separation processes.

Close attention to details of design, particularly relating to combustion and dust recovery, insures highest thermal efficiency and lowest drying cost. Heavy, rugged construction and use of high-grade materials contribute to long life and low maintenance.



GENERAL AMERICAN LOUISVILLE COOLERS

Louisville Coolers are of three different types: water tube, atmospheric and surface coolers — of which the last-named is designed for cooling lumpy, calcined material from 1800° Fahr. to 150° Fahr. for further processing.

Cooler illustrated has rotary shell and external water sprays. Heavy, rugged construction and use of high-grade materials contribute to long life and low maintenance.

FIRST PRECISION PART TO MILLIONS OF HORSEPOWER

MIDVALE CRAFTSMEN

PRODUCE GIANT TURBO GENERATOR SHAFT

The heart of the power conversion to electricity in America's dams is the huge shafts that carries the turbine blades and other essential parts. On its precision and long life depends millions of horsepower for homes, plants and factories of our country.

That is why Midvale craftsmen are called upon to produce huge turbo generator shafts similar to the one shown above—over thirty-four feet in length, ninety-six inches in diameter and machined to specifications.

Midvale precision and performance can supply all your needs for heavy equipment in industry. Pressure vessels for the petroleum and chemical industries . . . rolls for the paper and steel industry . . . rings for turbines and gears . . . forgings and heat and corrosion castings for all industries. If the job is big and the specifications exacting, you need the services of Midvale engineers and craftsmen.

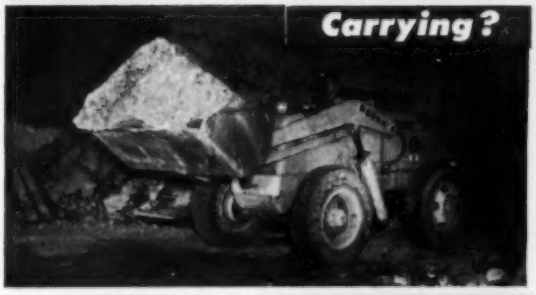
THE MIDVALE COMPANY
NICETOWN, PHILADELPHIA 40, PENNA.
OFFICES: NEW YORK • CHICAGO • PITTSBURGH
WASHINGTON • CLEVELAND • SAN FRANCISCO

MIDVALE

Custom Steel Makers to Industry

PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

What's Your Problem?



PAYLOADERS *Do Many Jobs!*

"PAYLOADER" tractor-shovels are successfully serving every branch of the Rock Product industry, including your own. These versatile, unit-design machines are available in many sizes and types to meet your needs in the pit, the yard or indoors.

"PAYLOADERS" are completely designed expressly for tractor-shovel service, with factors of stability, ruggedness and traction never before available. They have multiple speeds in reverse as well as forward that insure faster work and bigger production, plus many other advantages.

Your nearby "PAYLOADER" Distributor is one of 200 in the United States and Canada. He has parts stocks, service shops and skilled servicemen to keep your "PAYLOADER" a profitable investment. See him today for full "PAYLOADER" facts. The Frank G. Hough Co., 750 Sunnyside Ave., Libertyville, Ill.

Serving These Industries

Portland Cement	Ready Mixed Concrete
Crushed Stone	Concrete Products
Sand and Gravel	Gypsum
Lime	Phosphate
Industrial Sand	Other Minerals

WRITE for Literature on any "PAYLOADER":

Four-wheel drive Models HM — 1½ yd. and HR — 1 yd.; Rear-wheel drive Models HY — 1¼ yd., HF — ¾ yd., HE — ½ yd.; Front-wheel drive Models HAH — ½ yd., HA — 12 cu. ft.

SAY "HUFF"

PAYLOADER®

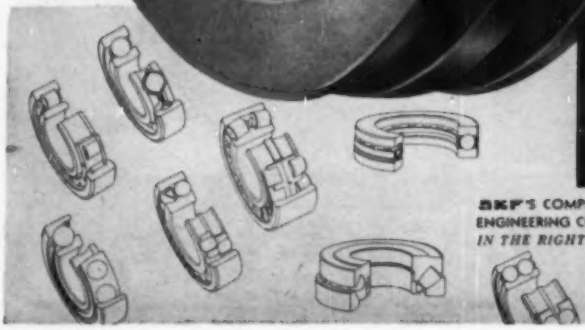
Here's why SKF Triple-Seal "SAF" Pillow Blocks are your solution:

- SKF Triple-Seal "SAF" Pillow Blocks are easy to install and inspect.
- The Triple-Seal rotating rings provide effective sealing from dirt; retains any kind of lubricant.
- The bearings are self-aligning.
- Available with ball bearings or spherical roller bearings, free or held . . . for either adapter mounting or direct mounting of bearing on shaft.

When you have a bearing replacement to make, call your SKF Distributor. He'll show you *why* you will minimize bearing trouble with SKF Triple-Seal "SAF" Pillow Blocks. Remember—your SKF Distributor is a bearing *specialist*.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.,— *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

7206-A



SKF®
BALL AND ROLLER BEARINGS

SKF'S COMPLETE LINE OF ANTI-FRICTION BEARINGS, PLUS SKF ENGINEERING CO-OPERATION, HELPS YOU PUT *THE RIGHT BEARING IN THE RIGHT PLACE.*

Before you buy:

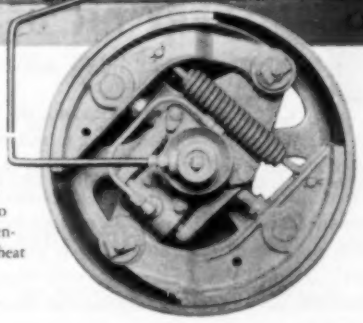
COMPARE CLUTCHES!

Link-Belt Speeder's hydraulic clutch needs fewer adjustments eliminates jerk, jump or lag

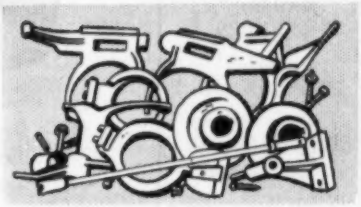
THE Speed-o-Matic power-driven hydraulic controls and clutch eliminate mechanical clutch linkage. This results in unequalled ease and speed of operation . . . smooth, instantly responsive action. You get longer lining life, freedom from frequent attention and far less chance for clutch failure.

For details on the Speed-o-Matic clutch . . . information on the Link-Belt Speeder line of crawler, wheel or truck mounted shovel-cranes, write:

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa



Speed-o-Matic Clutch shoes are actuated by perfectly controlled variable hydraulic pressure transmitted directly *into* the clutch. There are no mechanical linkages, no boosters. Clutch is self-compensating, automatically adjusts for heat and normal lining wear.

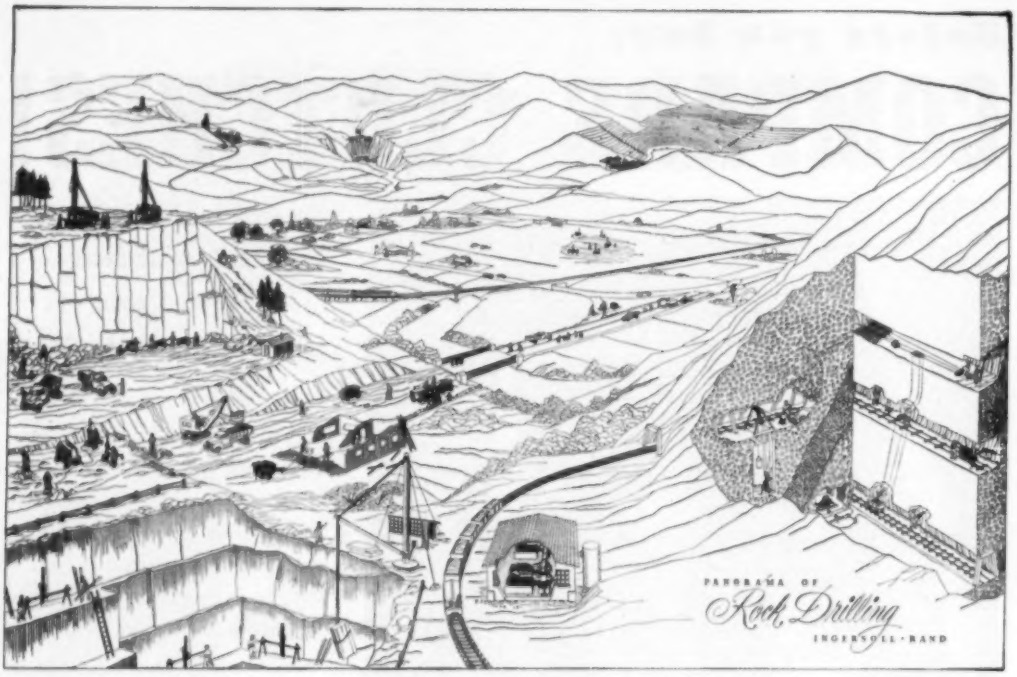


Eliminates up to 150 parts — there are no worn bushings, pins, links or clutch toggles to put you "down."

LINK-BELT SPEEDER CORPORATION

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...EVERYWHERE



Enlarged prints of this interesting and instructive drawing are available free of charge for schools, colleges and field offices. Write for a copy today.

INGERSOLL-RAND PRODUCTS

- Carset Jackbits
- Drifters
- Stopehamers
- Wagon Drills
- Jackdrills
- Boom Jumbos
- Quarrymasters
- Jackhamers
- Paving Breakers
- Jackrods
- Air Hose
- Air-Line Lubricators
- Hose Couplings
- Jackrod Furnaces
- Drill Steel Furnaces
- Sharpeners
- Jackbit Grinders
- Shank Grinders
- Cut-off Machines
- Slusher Hoists
- Air Tools
- Pumps
- Portable Compressors
- Stationary Compressors
- Diesel Engines

No matter what you need for drilling rock,

IT'S INGERSOLL-RAND EVERY BIT OF THE WAY!

Where does I-R fit into the rock drilling picture? Just about **EVERYWHERE**—as you can see from the above drawing in which the artist has included practically every rock drilling application.

But there's more here than meets the eye. For Ingersoll-Rand can supply everything from the Carset Jackbit all the way back to the compressor. From one source with undivided responsibility, you get a coordinated line of equipment that's designed to work together with maximum efficiency. You get complete service, too—backed by 80 years of experience and leadership in this specialized field.

Make Ingersoll-Rand your headquarters for everything in rock drilling.

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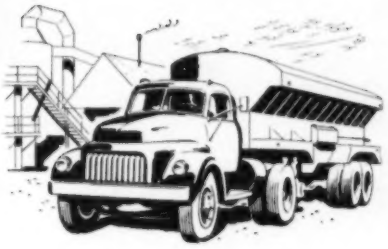
ROCK DRILLS • COMPRESSORS • AIR TOOLS • CENTRIFUGAL PUMPS • TURBO BLOWERS • CONDENSERS • DIESELS • GAS ENGINES

Eaton 2-Speed Axle Trucks cost less to run, less for upkeep,



More than
a Million-and-a-Half
in Trucks Today!

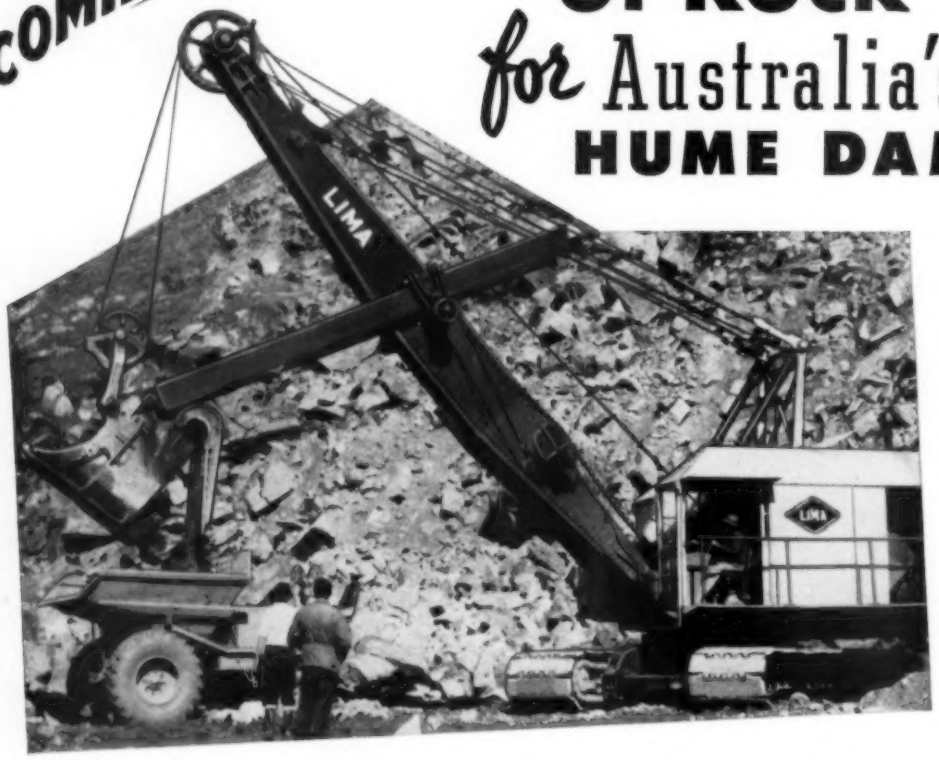
and last longer

Eaton 2-Speed Axles make available *twice* the conventional number of gear ratios, permit engines to run in their most efficient and economical range at all times, reducing stress and wear on vital parts. Eaton's exclusive planetary design, forced feed lubrication, and extra rugged construction cut maintenance cost. Ask your dealer why—working or trading—Eaton 2-Speeds make your trucks worth more.

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

COMING UP... 200,000 TONS of Rock for Australia's HUME DAM



This sturdy Lima Type 1201 shovel with 3½-cu. yd. capacity is playing a major role in enlarging Australia's Hume Dam. It is excavating, singlehanded, from a blue granite quarry, all of the rock needed to help raise the water level of the reservoir 20 feet and to increase its storage capacity 750,000 acre-feet.

The right shovel for this rugged job certainly is being used by the Public Works Dept. of New South Wales. The Lima Type 1201 has the extra power and durability that are so necessary for rugged digging in quarries or ore mining. We invite *you* to investigate this machine and find out how much it can increase your output and lower your costs. You'll like its friction-free operation through the liberal use of anti-friction bearings . . . and its air controls that make operating it such a pleasure.

There's a Lima for every job . . . shovels from ¾ to 6 cu. yds., cranes up to 110 tons, and draglines variable. Write us for our recommendation of the right machine to fit your needs.

LIMA DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

Construction Equipment Division

New— Revolutionary AIR SPRING

The GENERAL AIR SPRING in various sizes is now available to all vehicle and suspension manufacturers for design into complete suspensions and for conversions on both single and tandem axles.

AIR IS YOUR ANSWER TO LOWER COSTS

★ INCREASES PAYLOAD

The General Air Spring permits a savings of approximately 300 pounds more than the average steel suspensions. This allows up to *300 pounds more payload.*

★ INCREASES SAFETY

The General Air Spring assures positive braking action. Equal axle loading is maintained while brakes are applied, giving maximum brake effectiveness. No chatter, hop or bounce . . . loaded or empty.

Automatic air pressure control keeps body parallel to axles eliminating heeling over due to misloading, shifting loads or high crown roads.

★ REDUCES MAINTENANCE COSTS

Automatically measured air pressure fits every load condition from maximum to empty. This results in proper riding deflection, maximum spring efficiency.

Bottoming of springs with resulting strain on axles and frame is eliminated.

The absorption of road shocks and high frequency vibration reduces metal fatigue in frame and body.

Rubber mountings require no lubrication, minimum attention.

★ REDUCES OPERATING COSTS

Controlled, easy ride and positive braking action reduces bounces, excess deflection and skidding. Results in more tire carcass life and slower, even tread wear.

Controlled ride reduces cargo breakage. Eliminates high frequency vibration and reduces damage to perishable goods.

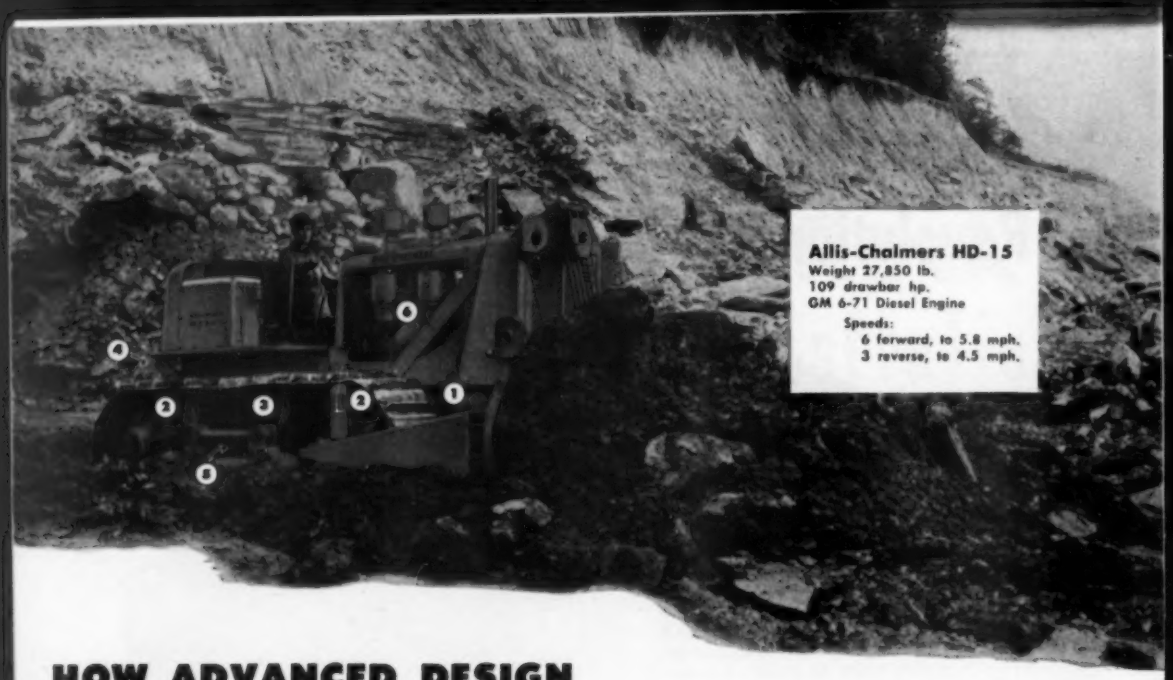
THE GENERAL AIR SPRING

• *For information write: Air Spring Division*

The General Tire & Rubber Co.

AKRON, OHIO

SPECIFY GENERAL AIR SPRINGS ON YOUR NEW EQUIPMENT



HOW ADVANCED DESIGN

Makes Allis-Chalmers Tractors more dependable

These heavy-duty tractors have toughness and ease of servicing to match their outstanding performance ability. Here are some of the advanced design features that provide extra strength and protection — keep Allis-Chalmers tractors on the job more hours:

1. One-Piece, All-Welded Structural Main Frame . . . strong and firm without a single ounce of excess weight — absorbs all vertical and horizontal stresses.

2. Extra Large Idler and Sprocket eliminates rocking action, puts more track on the ground for greater stability and better traction.

3. Spring-Loaded, Positive Seal keeps dirt, moisture and grime from damaging truck wheels, idlers and support rollers . . . you lubricate them only once every 1,000 hours.

4. All-Steel, Welded A-Frame Track Stabilizer permits free track oscillation, yet keeps tracks rigidly in line and absorbs thrusts and twists from shock loads and working on uneven terrain.

5. Oil Enclosed Track Release Mechanism reduces track maintenance and breakage. An adjustable screw lock provides positive holding action that maintains adjustment at required setting.

6. Engine Not Used as Structural Member — no strain is transmitted to it. Engine weighs less per horsepower developed, because of 2-cycle design — has modern unit injection.

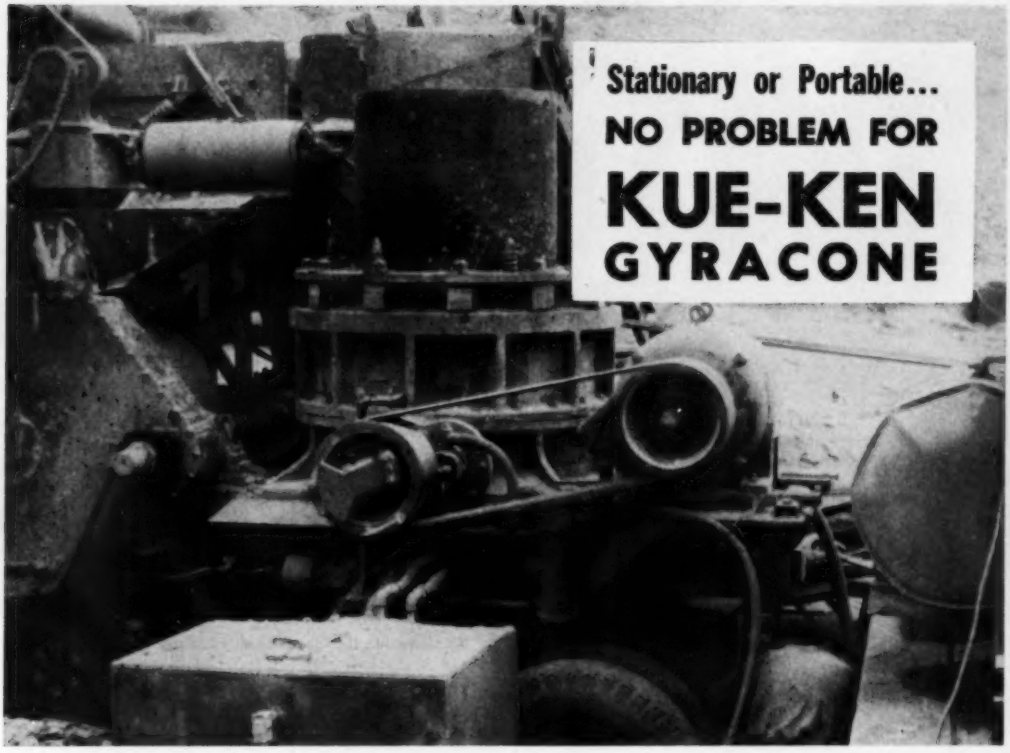
UNIT CONSTRUCTION SAVES SERVICE TIME

With Allis-Chalmers *unit construction*, major assemblies are easily removed without disturbing related assemblies. This brings real savings in time and money, puts tractors back to work faster. It assures better inspection and maintenance, too. Servicemen find it easy to remove major parts to correct trouble before damage develops.

Let your dealer tell you more about the toughness of Allis-Chalmers tractors, their time-saving unit construction — and their unequalled lugability and work power.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



Whether your crushing plant is stationary or portable, you'll find there's no problem about fitting a KUE-KEN Gyracone into the flow sheet. For example, using a portable roll crushing and screening plant, an Idaho contractor recently had trouble crushing basalt to ¾" in the required quantities of 100 to 125 tons per hour. Due to the toughness of the rock this capacity could not be met without causing excessive wear on the rolls. The obvious solution was to install a secondary crusher, but a difficulty arose in the fact that ordinary gyratories required too much headroom. A 36" KUE-KEN GYRACONE, requiring the lowest headroom of any gyratory available solved the problem. The KUE-KEN fit easily into his flow sheet, enabling the required capacity to be met, and eliminating excessive wear on the rolls. This report is only one of many that we are constantly receiving, proving time and again KUE-KEN's ability to solve a tough problem in the field.

No matter how tough your own crushing problem, the chances are that our engineering department will be able to help you solve it. It will pay you to investigate today.

See your dealer or write for factual illustrated data.

KUE-KEN pronounced "QUE-KEN"
U. S. and foreign patents pending

DEALERS: LUND MACHINERY CO., Salt Lake City, Utah; CLOSNER EQUIPMENT CO., San Antonio, Texas; WASHINGTON MACHINERY & STORAGE CO., Seattle, Wash.; CONSTRUCTION EQUIPMENT CO., Spokane, Wash.; EDWARD L. KROPP CO., Portland, Ore.; CAL-ORE MACHINERY CO., Medford, Ore.; MILLER MACHINERY CO., Missoula, Mont.; ANAHUAC MACHINERY CO., Mexico City, Mexico; UNIVERSAL EQUIPMENT CO., Vancouver, B. C.

640 CHESTNUT STREET • OAKLAND 20, CALIF.

STRAUB MFG. CO.

Kue-Ken Jaw Crushers	Revolving Screens	Rib Cone Ball Mills
Kue-Ken Gyracone Crushers	Classifiers	Concentrating Tables
Overhead Eccentric Crushers	Feeders	Vibrating Screens

Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor, Broad and Arch Streets, Philadelphia, Pennsylvania.

Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd., Authorized Licensed Manufacturer and Distributor Close Works, Gateshead-upon-Tyne, England.

Typical shot fired with "Nitramon" and "Primacord" MS connectors creates minimum vibration.

DU PONT "NITRAMON"

BRINGS DOWN WELL-BROKEN ROCK IN SILICA QUARRY

Face of Pioneer Silica Products Co. quarry before "Nitramon" shot.

Result shows good spread of well-broken rock. Makes shovel work easy.

Maximum safety and good fragmentation are prime reasons why the Pioneer Silica Products Company, Pacific, Missouri, regularly uses Du Pont Nitramon® blasting agent in their quarry blasting operations.

The Pioneer property is a high-grade silica deposit with banks approximating 65 feet in height. Average shots consist of from 6000 to 7000 pounds of "Nitramon" detonated with "Primacord" MS connectors, which produce split-second delay intervals between holes . . . greatly reducing both vibration and secondary blasting.

"Nitramon" is ideal in operations of this kind. It cannot be detonated by commercial blasting caps, open flame, friction or sudden shock. However, a "Nitramon" Primer (itself relatively insensitive) can always be relied upon to fire every charge.

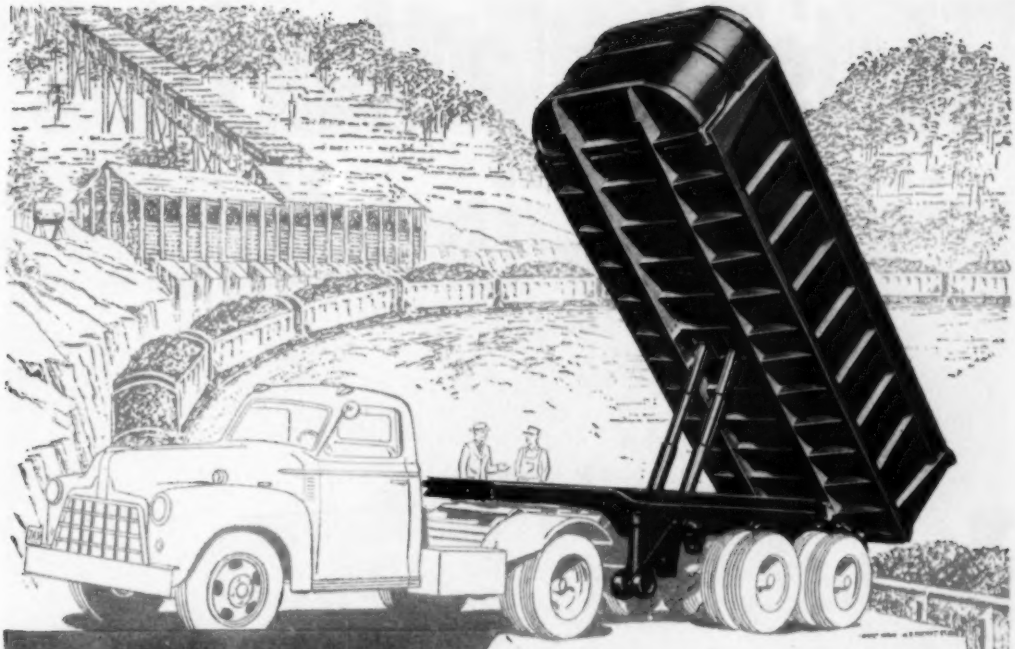
Ask your Du Pont Explosives representative for complete information about this safest blasting agent known. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT "NITRAMON"

A product of Du Pont Explosives Research

DU PONT

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY



use MARION BODIES AND HOISTS dump trailers for haulage efficiency

Many Marion owners are purchasing additional Marion Dump Trailers. These owners know the extra benefits that can be expected from Marion equipment.

They know that these benefits mean dollars saved . . . because of greater load-carrying capacities, less maintenance cost and fewer man-hours per-ton payload.

Marion all-welded Trailer Bodies are constructed to withstand sagging or twisting when loads are uneven or extra heavy. Marion's Heavy-Duty Hoists operate with extremely low, even oil pressures . . . without high-surge points during any part of the lift.

Marion Hoists are specially designed to provide load stability throughout the dumping cycle . . . thus reducing the possibility of overturning when operating under adverse conditions.

Marion's "Designed on the Job" Dump Trailers and heavy-duty hoists have the built-in endurance that insures a dependable, performance-plus operation.

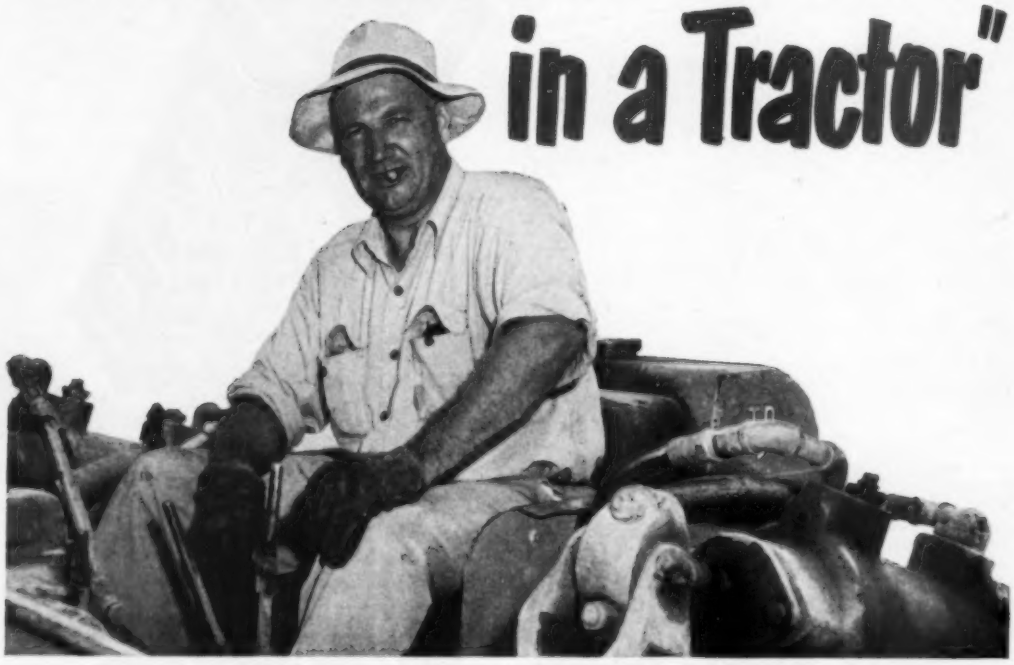
Get all the facts . . . call your nearby Marion Distributor or write direct—today!

MARION BODIES AND HOISTS

METAL PRODUCTS CO.
Marion, Ohio, U. S. A.

Manufacturing a complete line of standard and special Hydraulic Hoists and Dump Bodies

"That's What a Man Likes in a Tractor"



Hard-working International TD-9 scores big in Indiana quarry

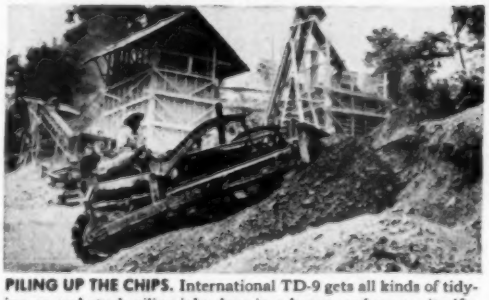
The Corydon Stone Company at Lanesville, Indiana, has numerous hurry-up calls for its trouble-shooting TD-9. Dozing crushed stone, pushing chips up on a 40-foot stock pile and cleaning around the crusher are only a few of the tasks it does better and faster.

Operator Steve Bachman says:

"I've operated crawler tractors going on thirty-one years, and I like Internationals better than all the others. The TD-9 really goes to the job in a hurry and gets the job done. That's what a man likes in a tractor!"

Make a date with your local International Industrial Distributor. He'll give you brass-tacks proof of how International power gets out the work. He'll show you fully-equipped repair shops, factory-trained men and full stocks of spare parts. You'll know that his customers are assured of long, profitable service from every piece of equipment he sells.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.



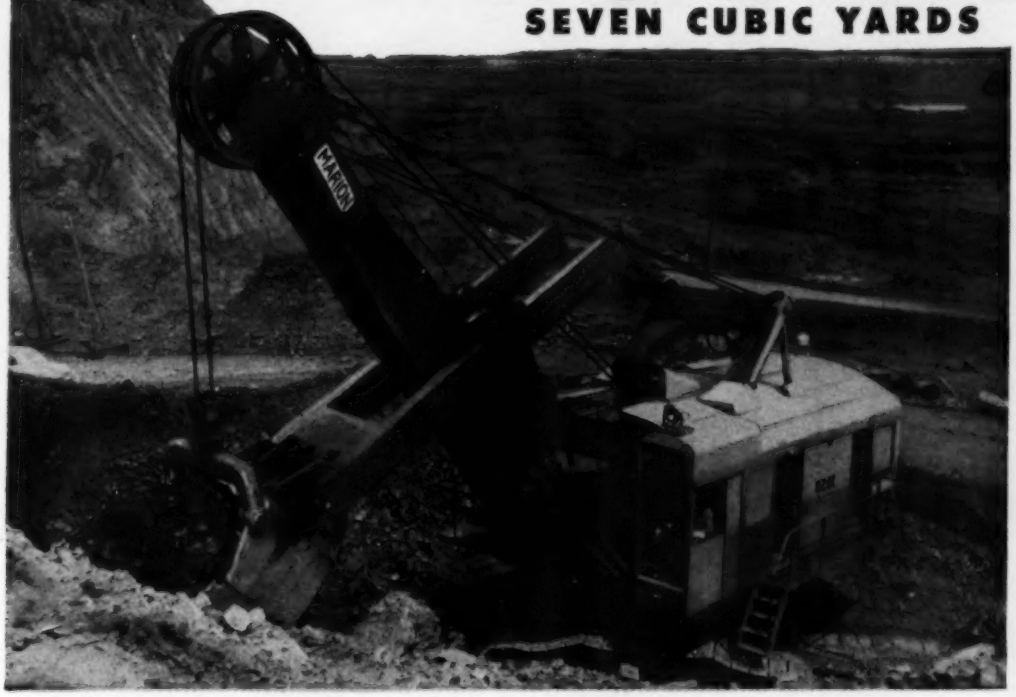
PILING UP THE CHIPS. International TD-9 gets all kinds of tidying-up and stock piling jobs done in a hurry, and proves itself a useful quarry hand.

INTERNATIONAL

POWER THAT PAYS

MARION 151-M

SEVEN CUBIC YARDS



This Big, Fast, Hard-Hitting Shovel Is Making History in Metal Mining

The seven-cubic-yard dipper of the MARION 151-M is only one indication of the work it can do.

The small-machine cycle time made possible by the world's finest electrical controls makes the 7-yard dipper of the MARION 151-M more productive than you might expect.

The month-after-month dependability of the 151-M, except for routine maintenance, is another big factor in year-long production output.

Don't say "seven isn't enough" until you see what others are doing with the biggest seven-yard performer that ever hit the mine pits.

Some of the biggest companies in mining are 151-M owners. More than half of these owners have two or more 151-M machines. Your nearest MARION District office can show you why.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

from ¾ cu. yd. to 45 cu. yds.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

—and now TAPER-LOCK

FROM the package to the shaft — ready, *immediately,* for the job! This is the new "off-the-shelf" availability which Dodge brings to roller chain drives. And, with this new availability, you get the important advantages of the famous Taper-Lock principle, proved in millions of V-belt installations.

No more costly and time-consuming boring of sprockets to fit your shafts! *Taper-Lock bushings are available in a range of sizes for the great majority of industrial applications.* And it's not necessary that shafts be turned and ground to get a tight fit. *Taper-Lock not only is keyed to the shaft, but grips it with the firmness of a shrunk-on fit.* Yet when a sprocket is to be replaced, it comes off easily, quickly. The bushing may be re-used.

Taper-Lock sprockets are compact. They have no flange, and no protruding parts. Taper-Lock occupies no more space on the shaft than standard sprockets. The flush design means safety.

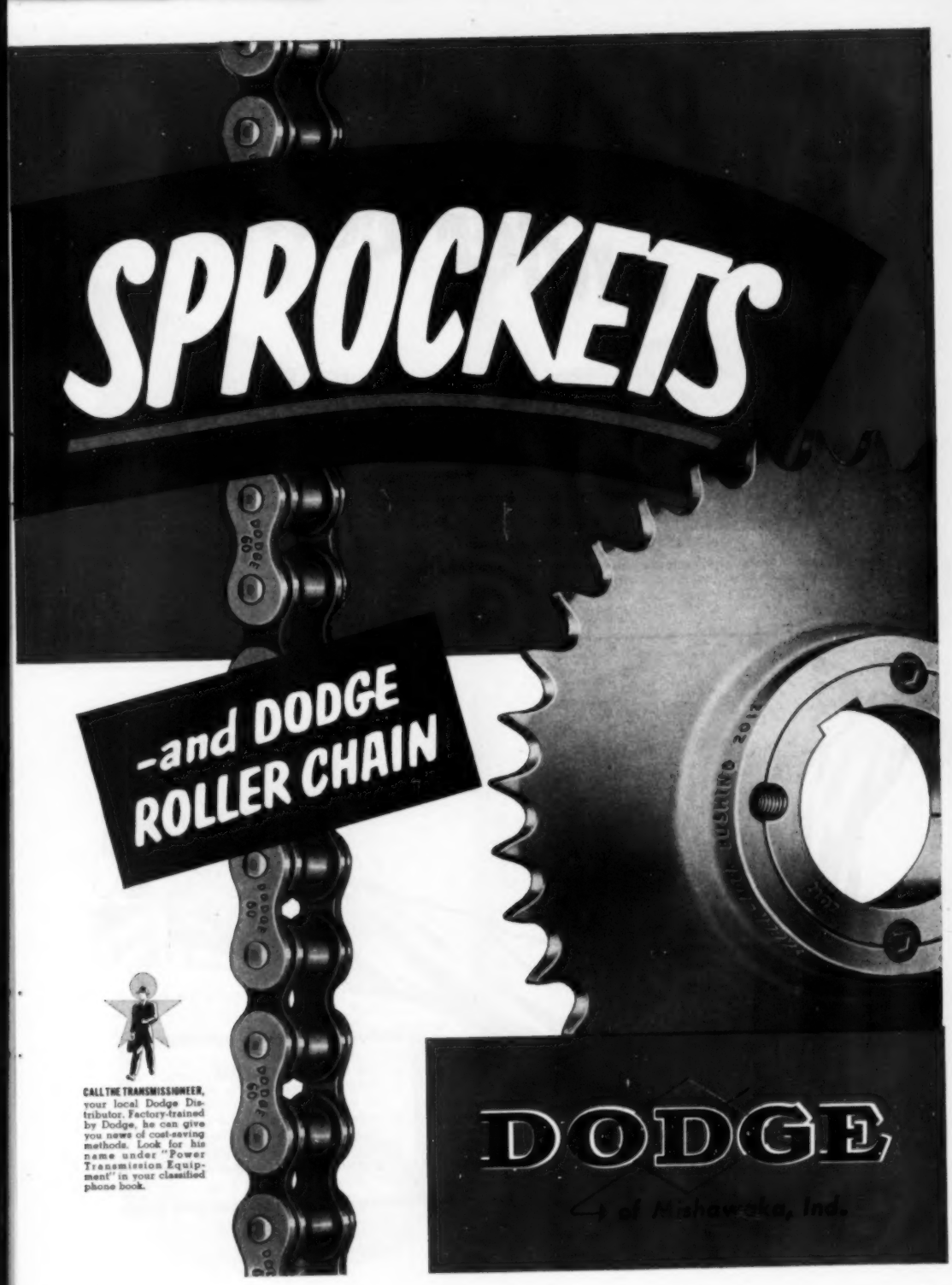
The new Dodge line of roller chain is made to highest quality standards, by craftsmen who know chain manufacture. Both chain and sprockets are made to ASA standards. Taper-Lock sprockets will take any make of American standard chain.

Taper-Lock sprockets will be carried in Distributors' stocks for immediate delivery, in a complete range of B-type steel sprockets—½″ to 1¼″ pitch. The range in ⅜″ pitch, for example, is 12 to 112 teeth.

All bushings and the smaller sizes of sprockets are packaged individually. Dodge roller chain is packaged in 10-foot lengths — and can be furnished in 50-foot and 100-foot reels.

For detailed information about Taper-Lock sprockets and Dodge chain drives write now for Bulletin A-624.

DODGE MANUFACTURING CORPORATION, 4000 Union St., Mishawaka, Indiana



CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you news of cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.

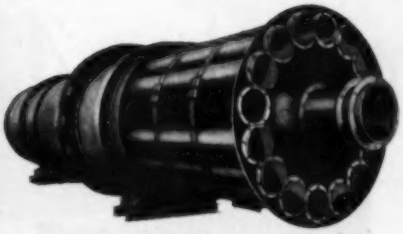
Everything's under control.

ALL Traylor equipment, made for the production of agricultural lime stone and lime products, is designed to attain the greatest degree of product control. To assure the highest quality of the end-product, the design of every Traylor machine is based on features developed over the last 50 years by Traylor's own corps of engineers. These features are exclusively Traylor's . . . job-tested and proved in installations all over the world. It is these features that offer closer control over all phases of your production. For a high quality product at low cost, buy Traylor . . . and relax.

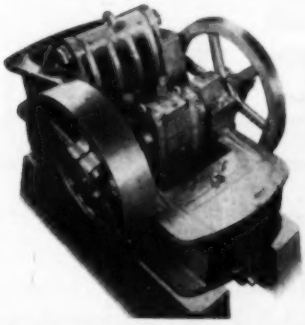
THE OPERATING FEATURES of every Traylor machine is fully illustrated in its own special booklet. For complete information and specifications on all types of equipment "Traylored" to your needs, ask for any of these booklets today.

. . . with Traylor Machinery for the production of lime products

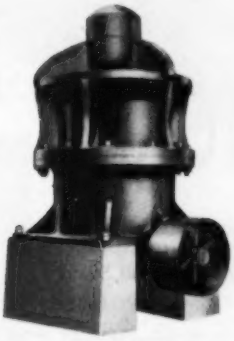
TRAYLOR ROTARY KILNS feature easily adjustable supports and single section rigidity of all-welded steel shells. These features assure perfect alignment to cut maintenance costs and reduce power requirements. All Traylor Rotary Kilns are designed to meet the particular requirements of each installation.



TRAYLOR ROTARY COOLERS employ the same exclusive design principles as Traylor Kilns . . . offer the same maintenance economies and are built to individual specifications. Traylor makes three types of coolers to meet practically all requirements; Conventional, Diaphragm and Multiple Tube. Special coolers are provided.



TRAYLOR JAW CRUSHERS are of massive construction for heavy-duty primary breaking. They are designed in five types with feed openings ranging from 8" x 12" up to 60" x 84". Each type features Traylor's exclusive curved jaw plates which deliver a greater tonnage of finer product with less horse power.



TRAYLOR TY REDUCTION CRUSHER is noted for its simple, compact design for maximum strength and operating efficiency. Non-chokable, self-tightening Bell Head and Curved Concaves produce an exceptionally uniform product with fewer waste fines. Available in six sizes with feed openings from 3" to 22".

A Traylor LEADS TO GREATER PROFITS

TRAYLOR ENGINEERING & MANUFACTURING CO.
586 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P.Q.

"For TOUGH JOBS... No Other Oil can match Sinclair SUPER TENOL"

... Elvin L. Jones, Supt. of Maintenance
Standard Sand and Silica Company

The Standard Sand and Silica Company of Davenport, Florida, mines 2,000 tons of sand a day, six days a week. Its products are used in concrete, masonry work and in sandblasting ships, buildings and railroad equipment.

One of the main pieces of equipment is a Super C Tournadozer. Mr. Elvin L. Jones, Supt. of Maintenance says that "Sinclair SUPER TENOL® is giving *superior service* in this machine. When it comes to tough jobs . . . there's not another oil on the market that can match SUPER TENOL."

He continues, "SUPER TENOL has also been used in our G.M. 6-71 diesel for 18 months. One third of the time, this machine operated 24 hours a day . . . *and we haven't spent a single penny for maintenance.*"

To find out how Sinclair Products can help you cut maintenance costs and keep production in high gear, call your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N.Y. **SINCLAIR SUPER TENOL**

... for YOUR Tough Jobs

YOU'RE 5 YEARS AHEAD
when you buy a Jaeger compressor

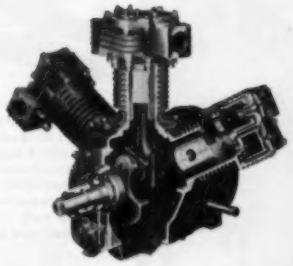
Some compressors are still being built to the old 1932 ratings which are too small for modern air tools.

Other models have recently appeared with the higher ratings needed today.

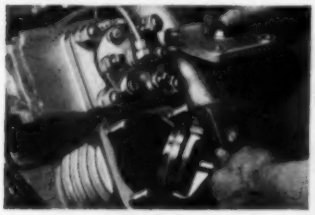
These higher ratings, which others now offer in "new models," are the ones Jaeger has been building for 5 to 7 years, and backs with proved performance of more than 30,000 "new standard" compressors in the field.

NEW:	**75 cfm**	**125 cfm**	**185 cfm**	**250 cfm**	**365 cfm**	**600 cfm**
OLD:	60	105	160	210	315	500

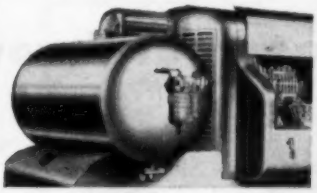
These 15% to 25% higher ratings insure 90 to 100 lbs. pressure at today's big tools, instead of 70 lbs., increasing their work output by 30% to 40%. No "old standard" machine can successfully compress, cool and deliver these larger air volumes. No new compressor has been built to deliver these volumes with the smooth, cool, long-life performance of the Jaeger Air-Plus.



Balanced W-type 2-stage compressor standard in all sizes, 75-600 ft. Cooler and smoother running than any V-type.



75% to 100% larger valves for free flow without back-pressure.



Larger intercoolers, and air receivers. Relief valve for automatic drainage standard on all models.

Jaeger "Fuel Miser" standard on all models where automatic control of engine speeds means worthwhile fuel savings.

Run these tools at 90-100 lbs. pressure

Model 75: 1 heavy breaker

Model 125: 2 heavy breakers or a 55 lb. sinker

Model 185: 3 heavy breakers, 1 heavy rock drill, 2 medium rock drills, or one light wagon drill

Model 250: 3½" wagon drill or 2 heavy rock drills or a 10 hp Ka-Mo earth drill

Model 365: 4" wagon drill plus a plug-hole drill, or runs 15 hp Ka-Mo earth drill

Model 600: Two 4" wagon drills and hand held drill, or runs 9B-3 pile hammer.

Lowest cost compressed air you can buy today

Prices of Jaeger "new standard" compressors are in every case below those being asked for old standard compressors of 15% to 25% less air capacity. On the basis of cost-per-cubic-foot-of-air-delivered, the difference is even greater, amounting to many dollars saving on every cubic foot of air capacity. On the basis of work output, the difference is greatest — amounting to 30% to 40% more production through more efficient operation of your air tools.

Why pay more and get far less when you can buy a proven Jaeger Air Plus Compressor.

For full facts about tools and their air requirements see your Jaeger distributor or ask for Catalog JC-1.

THE JAEGER MACHINE COMPANY

602 Dublin Ave., Columbus 16, Ohio

CONCRETE MIXERS • TRUCK MIXERS • PUMPS • PAVING MACHINERY

Rex® Combination-Durobar® Chain is an ideal chain for many single strand bucket elevator applications. Eccentric barrel feature eliminates much of the grinding action between leading barrel and sprocket tooth . . . adds to life of both chain and sprockets.

Rex Ley Bushed Chain is designed for elevator service under very abrasive conditions. Pins are prevented from turning in side bars, confining flexing action to hardened steel surfaces between pins and bushings. Principal wearing parts are easily renewable.

Rex Chabelco® Chain is an all steel chain of high strength, used extensively for elevating heavy and abrasive bulk materials in cement mills and quarries. Relative light weight combines with strength and hardened wearing surfaces to produce unusual lasting qualities. Also popular as a heavy duty drive chain.

Does your "moving picture" rate 4 stars?

When it comes to moving bulk materials, it's especially important that you get top performance at lowest costs. It makes a big difference in that vital matter of profit or loss. That's why it pays you to investigate the Chain Belt line of materials handling equipment.

Whether your "moving picture" calls for chains and sprockets, belt conveyors, complete bucket elevators, feeders, or apron and pan conveyors, you'll find in the complete Chain Belt line the exact equipment that best fits your requirements for low-cost materials handling.

Rex Engineers are well qualified by years of experience to help you with your design, selection and replacement problems. They are backed by equipment which has been recognized as "tops" in quality for over 60 years. Call your nearest branch office today or write for our new 44 page booklet on Rex Equipment for the Cement and Rock Products Industries. Chain Belt Company, 4604 W. Greenfield Ave., Milwaukee 1, Wis.

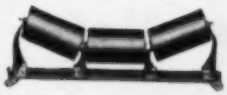
CHAIN BELT REX COMPANY

Chain

ATLANTA • BALTIMORE • BIRMINGHAM • BOSTON
BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS
DENVER • DETROIT • EL PASO • HOUSTON
INDIANAPOLIS • JACKSONVILLE • KANSAS CITY
LOS ANGELES • LOUISVILLE
Distributors in principal cities
Export Offices:

Rex Heavy Duty Drag Chain has links of massive construction proportioned for strength and wear. Wide-faced barrel acts as a scraper. Used extensively for handling both hot and cold clinker.

Baldwin-Rex® Roller Chain is a high strength, precision-built, finished steel chain widely used in drive applications. Especially suitable where high speeds are encountered. Available in a complete line from ⅛" to 2½" pitch.



Rex Belt Idlers are the backbone of all types of belt conveyors. Triple labyrinth grease seal assures longer life and low maintenance costs . . . guards against costly "freeze-ups." Available in a wide range of designs and sizes to suit every application.

Rex Standard Bucket Elevators are made in 3 basic designs . . . Centrifugal Discharge type, Continuous Bucket type and Super Capacity type. All major component parts are made by Chain Belt Company. Specials can be manufactured to order to fit unusual applications.

Rex Temperim® Sprockets have specially hardened rims with extremely uniform tooth contours. They will not wear rapidly even under severely abrasive conditions. Thus, they help to maintain chain pitch and prolong chain life.

Rex Apron and Pan Conveyors are ruggedly built for heavy-duty handling of loose bulk materials. Available in a wide variety of styles to meet requirements of the material being handled. Often used for handling extremely hot material. Square through-rod construction adds to long life.

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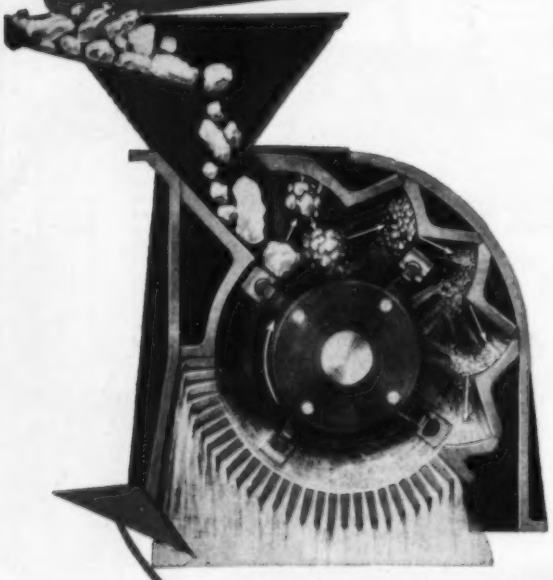
PULVERATOR Hammermills



1. SQUARE HIT

A square hit is the most powerful breaking blow. *Pulverator* hammermills are designed to utilize this important principle of impact crushing. Feed is hit squarely by flat hammers.

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Hammers break and repeatedly smash the material squarely against involute breakers—resulting in a minimum of wear on breaker plates. *Pulverators* may be operated with or without grate bars and at various speeds.

3. HIGH PRODUCTION

The multi-impact principle produces more fines ahead of the grate bar section. With more fines passing the grate, you get high production at lower cost. Also — power requirement and maintenance are reduced.

4. QUALITY PRODUCT

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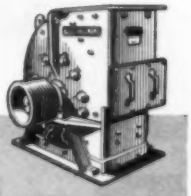
5. RENEWABLE PARTS

Liners, breaker plates, hammers, hammer arms and individual grate bars can be replaced separately. Hammers and grate bars are reversible.



Pulverator hammermills are built in five sizes, capacities 2½ to 160 tph. Get more facts from the A-C representative in your area, or write for *Pulverator* Bulletin 07B6265A, Allis-Chalmers, Milwaukee 1, Wis.

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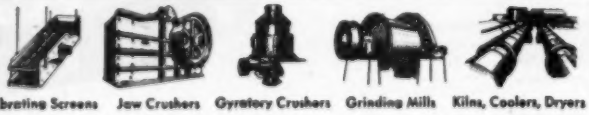

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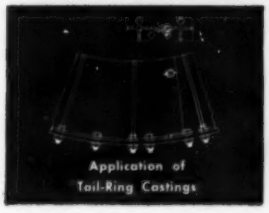

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S-424

editorial

Highways and Safety

MANY sound reasons have been advanced for the modernization and expansion of our already vast network of highways. Most of these have been based on the economic and time-saving elements. The soundest argument of all, however, hit the headlines recently with the release of figures on the traffic accident toll in 1952. According to the Travelers Insurance Companies, there were more than 2,000,000 casualties in that year, the highest number in the nation's history. Traffic deaths totaled 37,600, an increase of 500 over 1951, and the third consecutive year of increase. Injuries soared to 2,090,000, an increase of more than 127,000 over the previous year. Much of this tragic toll can be attributed to the inadequacy of our present highway system.

Statistics can be quoted on the various reasons for this appalling total of deaths and injuries and they can be divided into many classifications. For instance, in 1952 excessive speed killed 13,430 and injured nearly 600,000; drivers under 25 years of age were involved in almost 25 percent of the year's fatal accidents, although they constitute only about 15 percent of the total of all drivers; three out of four 1952 auto accidents happened to passenger cars driven in clear weather on dry roads; Saturday was the most dangerous day of the week to drive; 8,650 pedestrians were killed and 295,430 were injured in traffic accidents.

THESE are all pertinent figures and they point to ways in which this continuing national calamity could be lessened. They show that proper training and education, stricter supervision and control, and stiffer penalties for violators, should materially reduce this toll. The statistics show also that nationwide driver examinations, stricter than any now in force, could help lower it. All these things have been and are being tried and undoubtedly they are doing and will continue to do much good. In spite of them, however, the accident toll continues to rise. All these reasons involve the human element, and improvement in any of them is therefore slow, uncertain, and extremely limited.

There is a growing conviction that the main factor contributing to accidents of nearly all types and under nearly all conditions is the pitiful inadequacy of our present highway system. Excessive speed is rated our biggest killer, yet a speed which is dangerous and illegal on our state highways is considered safe on our few modern toll superhighways. Pedestrians will probably always be coming out second best in contacts with cars; but with modern highways which keep pedestrians off the roads such accidents would be greatly reduced. Week-ends are the most dangerous for drivers, due largely to congestion caused by too many cars and too little road.

ALL this leads to but one definite conclusion—that construction of adequate and safe highways is the only sure and quick way to effect a substantial reduction in our traffic toll. It is the only one not involving the human element and therefore the only one which can be quickly and easily improved. The National Safety Council estimates that one out of every 12 highway fatalities is due directly to road defects; no figures are available on those indirectly attributable. To be sure, highways are expensive to build, but what would it be worth to save say 5,000 lives and prevent 300,000 injuries each year? The huge financial savings which would result from the reduction of accidents and the elimination of congestion are of secondary importance.

MOST of the highways now in existence are attempting to serve both long-distance, high-speed traffic and short-run, slow-speed traffic, an impossibility on any two-lane road. The result is inevitable. The only possible solution is to build highways which segregate these two types of traffic as much as possible. This means a network of east-and-west and north-and-south transcontinental superhighways with no crossroads at grade and the least possible number of points of entry and exit. Such highways, especially if tolls are charged, would discourage purely local traffic. Branching off of these highways should be similar but less exclusive arteries to and between large cities. The bulk of the present extensive highway system could then be used almost entirely by the local traffic.

Most of our present highways were designed and built shortly after World War I, when truck loads were light and the volume of motor travel was small. Twenty-five years ago there were only 20,000,000 motor vehicles; today there are over 53,000,000. The new miles of highway built in that period could not even park the added number of cars. Actually, the economic loss from accidents each year exceeds the amount spent on our entire system of highways, roads, and streets.

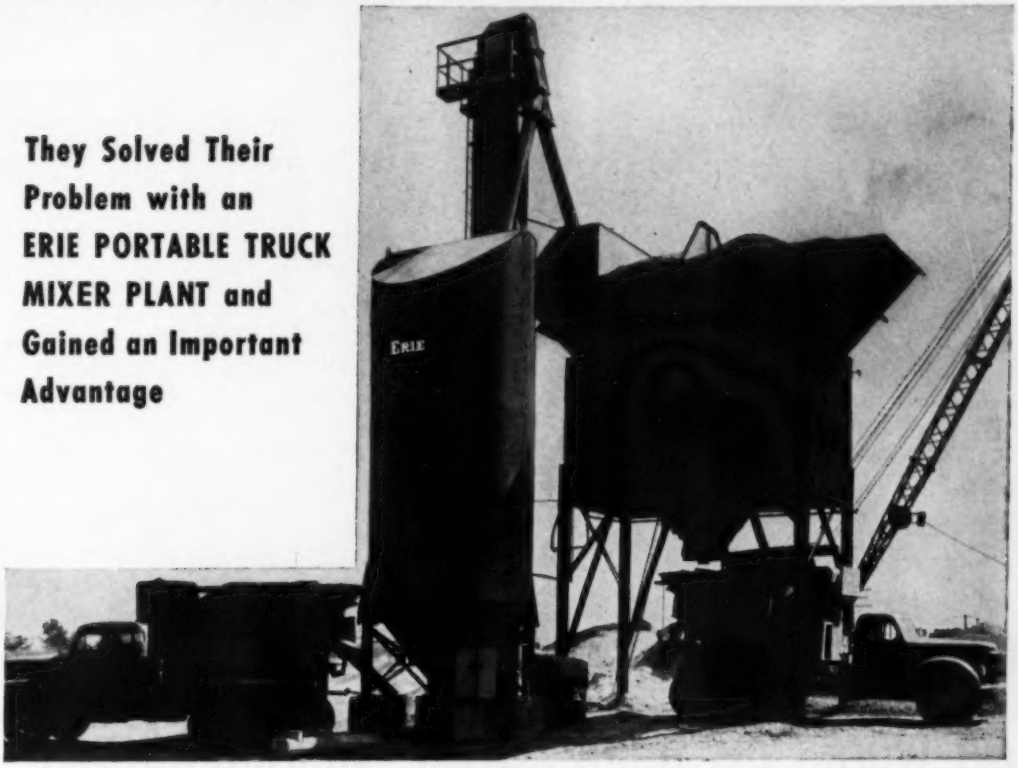
THE entire subject of our inadequate highway system has been receiving more attention in all quarters in recent years, and prospects are more encouraging than ever before. This is due to a large extent to P.A.R., Project—Adequate Roads—an organization whose declared purpose is "to stimulate public support and activity so that the nation's highway plant will be able to take care of the ever increasing traffic needs."

P.A.R. is an informal organization consisting of representatives of leading associations and manufacturers. It has no budget or financial contributions and relies on its participants to do the work or provide it. To be completely successful, the message of P.A.R. must get to everyone and be supported by everyone. You can help by getting in touch with your own state Highway Users Conference or by writing P.A.R., 952 National Press Building, Washington, D. C. Every driver, whether or not he is a producer of materials going into highways, should cooperate with P.A.R. and every other organization which similarly works for the improvement of our highway systems.

Walter E. Trauffer

HERE'S HOW MACDOUGALD-WARREN LICKED ATLANTA'S GROWING PAINS AND KEPT CONCRETE COSTS DOWN

They Solved Their Problem with an ERIE PORTABLE TRUCK MIXER PLANT and Gained an Important Advantage



MACDOUGALD-WARREN'S . . . ERIE PORTABLE TRUCK MIXER PLANT GTES-79 WITH 600 BBL. GROUND SILO

Atlanta's development and growth program posed a problem for MacDougald-Warren, one of the South's ready-mix operators. Much of the construction is in the newer parts of town, away from MacDougald-Warren's central location. This meant long hauls . . . fewer trips . . . higher costs.

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Said Mr. Edward Kelley, "Our Erie truck mixer is portable and also gives us central plant capacity. In one run it averaged 60 yards for nine hours straight. We'll use our Erie Portable here in Atlanta and on jobs throughout the south."

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More Facts About Erie's GTES-79 Portable Truck Mixing Plant

One man can operate this unit at full capacity.

It's pre-assembled into large sections which make set-up and take down fast and easy. Stows compactly for over-the-road transit too.

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He works his quarry with "thoroughbreds"

HOWARD E. MARKS, owner of the Skyline Quarry, near Belmont, Calif., has had Caterpillar equipment since 1922. "We find Caterpillar machines are real thoroughbreds. We're 100% owners of Cat* products, and plan to stay that way," he says.

The Caterpillar DW10 with matching No. 10 Scraper is one of Mr. Marks' "thoroughbreds." His other Caterpillar machines include two track-type tractors, two motor graders and a ripper. The quarry produces 4,000 tons daily of base rock and concrete aggregate, and also has an asphalt plant.

This Cat DW10 Tractor can highball at 24.5 m.p.h. for fast, low-cost cycle times. Its rugged Diesel engine delivers real power on inexpensive No. 2 furnace oil. The companion No. 10 Scraper hauls a heaped load of 11 yards, and, being cable operated, loads smoothly and can pump "dead" material. Positive ejection spreads the load quickly and evenly. With its sharp turning ability, stability in rough going, and excellent operator visibility both front and rear, the combination of Cat DW10 Tractor and No. 10 Scraper is a "natural" for work in mines and quarries.

Your Caterpillar Dealer will gladly demonstrate the fast-hauling tractor and scraper that best fit your needs. And you can depend on him to provide skilled service and genuine factory parts for the machines he sells. Call him today.

Caterpillar Tractor Co., Peoria, Illinois.

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news of the industry

PIT AND QUARRY

R. C. Ried, Noted Engineer, Engineering Firm Founder Succumbs at Age of 41

R. C. Ried, of R. C. Ried, Engineers, New York, N. Y., who was well known in the cement industry throughout North and South America, died on March 27.

Mr. Ried was born May 5, 1912, at West Conshohocken, Pa., and was educated at Villanova College. He was a licensed professional engineer in the state of New York. From 1928 to 1930 he was a draftsman for the Valley Forge Cement Company at West Conshohocken, where he worked on detail drawings of machinery built to metric standards, converting them to American standards for the manufacture of repair and replacement parts in the United States. While attending Villanova Mr. Ried continued working for Valley Forge.

From 1935 to 1940 he was flotation engineer for the Separation Process Company, Catasauqua, Pa. During this time he worked on process development and plant engineering. He also secured three reagent patents.

In 1940 he became assistant superintendent of the Valley Forge Cement Company. When he later became superintendent, he was responsible for the complete operation of the plant. From 1944 to 1947 he served the American Transportation Corporation as manager-general at Pittsburgh, Process Equipment and Export Division.

His post immediately before forming his own firm in 1951 was that of senior partner of Knowles Associates, consulting and designing engineers.

Mr. Ried was affiliated with the American Institute of Mining and Metallurgical Engineers, the American Society of Merchanical Engineers, and other professional organizations.

Big Storage Building Erected By Penn-Dixie at Kingsport

A large raw-material storage building is being constructed at the Kingsport, Tenn., plant of Penn-Dixie Cement Corporation. This is the second step in the modernization of the Kingsport mill, following recent installation of new kilns and dust collection equipment.

The new 90- by 300-ft. building, scheduled for early completion, will have the capacity and modern crushing and screening equipment for processing approximately 1,500 tons of limestone daily, in an eight-hour operation.

R. C. Ried

10,000-Bbl. Daily Output Reported at San Andreas By Calaveras Cement Co.

The enlarged and modernized plant of Calaveras Cement Company at San Andreas, Calif., is capable of manufacturing 10,000 bbl. of cement per day without encountering a single bottleneck from quarry to loading platform, it was revealed in the annual Calaveras report of William Wallace Mein Jr., president.

According to the report, the plant expansion involved an investment of $3,000,000 during 1952. Financing was by means of insurance and bank loans, of which $300,000 already has been repaid. Mr. Mein stated that in spite of heavy cash outlays for new plant, consolidated net working capital was increased to $1,862,415 at the end of 1952, as against $1,712,109 at the end of 1951.

Sales and profit figures, announced by the company in February and March, were as follows: consolidated net sales, $5,284,777 in 1952, as compared to $5,797,129 in 1951; consolidated net earnings, $160,002 in 1952, as compared to $618,604 in 1951. Bad weather, a prolonged carpenters' strike, accelerated amortization, and increased costs were cited as reasons for the lower earnings.

Coming Events

May 13-15, 1953 — Hot Springs. 18th annual meeting, National Industrial Sand Association. The Homestead.

June 8-10, 1953 — Hot Springs. 51st annual convention, National Lime Association. The Homestead.

June 12, 1953—Chicago. Directors' meeting, National Agricultural Limestone Institute. Edgewater Beach Hotel.

June 15-16, 1953 — Province of Quebec, Canada. Directors' meeting, National Crushed Stone Association. Seigniory Club.

June 29-July 3, 1953 — Atlantic City. 51st annual meeting, American Society for Testing Materials. Chalfonte-Haddon Hall.

September 28-30, 1953—Colorado Springs. Directors' meeting, National Sand and Gravel Association. The Broadmoor.

September 28-30, 1953—Colorado Springs. Directors' meeting, National Ready Mixed Concrete Association. The Broadmoor.

October 12-14, 1953—Birmingham. Annual operating meeting, National Lime Association. Tutwiler Hotel.

October 21-23, 1953—White Sulphur Springs. Annual fall meeting, National Industrial Sand Association. The Greenbrier.

Continuing Boom Noted In Building Totals For March, First Quarter

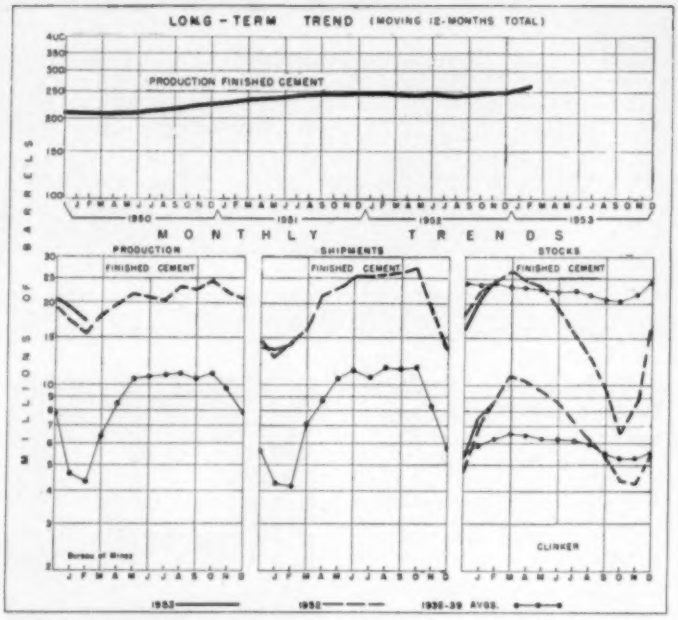
The construction boom continued in March to tighten its grip on the prospect of setting another record high in 1953. F. W. Dodge Corporation announced that its March figures for construction contract awards contained in the Dodge Reports carried the total for the first quarter to 11 percent over the first quarter of 1952, in the 37 states east of the Rockies.

For March the residential figure was the star among the Dodge classifications, with a total of $605,200,000, up 45 percent over February and 2 percent above March, 1952.

The three-month total reached $3,444,696,000. Dodge's March reports totaled $1,347,518,000, up 32 percent over February and 2 percent over March, 1952.

Nonresidential awards in March were $449,175,000 or 20 percent more than in February, but 3 percent less than in March, 1952. Heavy engineering (public works and utilities) totaled $293,143,000 or 28 percent more than in February and 11 percent more than in March, 1952.

Other three-month 1953 figures compared with the three months in 1952 were as follows: non-residential, $1,230,410,000, up 10 percent; residential, $1,483,804,000, up 12 percent; heavy engineering, $730,482,000, up 11 percent.



SUMMARY — Production of finished portland cement in February, 1953, totaled 17,325,000 barrels, as reported to the U.S. Bureau of Mines — an increase of 5 percent over the February, 1952, figure. Mill shipments totaled 14,155,000 barrels — 1 percent lower than in the preceding February — while stocks of 24,464,000 barrels were a fraction of 1 percent lower than at the end of February, 1952. Clinker production during the month totaled 18,917,000 barrels — 2 percent more than in February, 1952.

PRODUCTION — One hundred and fifty-five (155) plants located in 37 states and Puerto Rico reported a production of 17,325,000 barrels of finished portland cement during the month, as compared to 151 plants which manufactured 16,545,000 barrels in February, 1952. Clinker production during the month totaled 18,917,000 barrels, as compared to 18,541,000 barrels in the previous February.

SHIPMENTS — Mill shipments of finished portland cement were 1 percent lower than in February, 1952, and totaled 14,155,000 barrels. Shipments were greater in 8 districts, smaller in 11 districts, and unchanged in 1 district than those of February, 1952. The highest percentage increases were recorded by the Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi and the New York-Maine districts, where shipments were 28 percent and 20 percent higher, respectively, than in February, 1952. The Tennessee district recorded a 20 percent drop, and several other districts showed declines of 10 to 19 percent.

STOCKS — Mill stocks of 24,464,000 barrels of finished portland cement were on hand February 28, 1953 — 0.2 percent less than at the end of February, 1952 — while stocks of clinker amounted to 8,829,000 barrels — 2 percent less than on February 29, 1952.

Davison Chemical Corp. Builds Superphosphate Plant

A $12,410,000 superphosphate plant is now under construction for the Davison Chemical Corporation at Bartow, Fla. The new plant will have an annual capacity of 200,000 tons and will be in operation within a year.

It was reported that this plant is the largest construction project in the phosphate industry. It was further indicated that about $35,000,000 worth of phosphate plant construction is at present under way.

Entry of Davison into the phosphate industry will boost total annual capacity to 1,000,000 tons.

Mexican Commerce Chamber Urging Export of Cement

The National Chamber of the Mexican Cement Industry is holding a series of meetings with the Treasury Department, National Railways of Mexico, and the Bureau of Standards to arrive at "a firm accord for the establishment of solid bases for the exportation of cement". This move has been taken as a result of Chamber insistence that national production now exceeds internal demands.

The possibility of Mexican cement exports has been considered unofficially for some time, especially since interest has been expressed by foreign purchasers, principally Central American and South American republics. A cement industry reinforced by recent rehabilitation of plants and equipment and embarking on new production levels needs an expanded market.

According to Federico Sanchez Fogarty and Raul Arredondo, vice-president and manager, respectively, of the Chamber, the organization is seeking to obtain "special" freight rates for cement earmarked for export. They would like at least a 50 percent reduction in freight costs. It is claimed that the railroad would not lose money because empty freight cars returning from Mexico City deliveries could be used to deliver shipments to ports.

Studies have been initiated to improve all minimum-quality standards of Mexican cement, so that product can compare favorably with imported cements. With standards of quality guaranteed high, spokesmen insisted that surplus production could easily be sold in the international market. Brazil, among other South American republics, has indicated an interest in acquiring substantial orders from Mexico.

National annual demand fluctuates between 1,600,000 and 1,700,000 tons. With a possible 2,000,000-ton production, there would be a surplus of 300,000 to 400,000 tons.

C. G. Cooley, sand-and-gravel producer, who is also prospecting for gold, recently signed a contract with the city of Englewood, Colo., for an option on 54 acres of city-owned land along the Platte River. Surveys indicate that there are almost 45,000 tons of gravel to the acre. Mr. Cooley will pay 7 cents royalty per ton, plus 10 cents in royalty on gold reclaimed. He must pay Englewood at least $2,400 per year and must supply low-priced gravel for street work.

Texas Industries Buys Ft. Worth Sand-Gravel And Four Affiliates

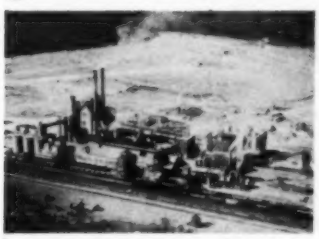
Texas Industries, Inc., has completed arrangements to buy controlling interest in Fort Worth Sand & Gravel Company, Inc., and four associated companies. This announcement was made jointly by Thomas E. Popplewell, president of the Fort Worth companies, and Ralph B. Rogers, president of Texas Industries, Inc., Dallas.

Associated companies involved in the transaction are the B. & R. Transportation Company, the Thomas Gravel Company, the Gravel Mining Company, and the Texas Dry Concrete Company. All maintain headquarters in Fort Worth. The transaction is subject to consummation of underwriting and other regulations, and the purchase price was not revealed. Mr. Popplewell and all key personnel will continue to operate the new divisions as formerly, according to Mr. Rogers.

Among the principal activities of Texas Industries, Inc., are the production and sale of lightweight expanded clay or shale aggregate under the trade name "Haydite", and the manufacture and sale of haydite and heavyweight concrete masonry units, lintels, joists, and other pre-cast concrete products and concrete pipe under the name "Texcrete".

While domestic bauxite production increased substantially in the fourth quarter, the total for 1952 was 5 percent lower than in the preceding year, according to the U. S. Bureau of Mines. Approximately 96 percent of the year's production—1,751,845 tons—was mined in Arkansas, but the southeastern states produced nearly double their 1951 tonnage. Only one-third of the new supply (as determined by adding imports to production) came from domestic sources during 1952.

Cover Picture....



● The cover picture this month is an aerial view of the Basic Refractories Incorporated plant at Maple Grove, Ohio, which is the largest refractory dolomite plant in the world. This view shows the firm's four burning plants in the foreground and the quarrying operation in the background. An article dealing with Basic's recent $4,000,000 expansion and modernization program, featured by the installation of two huge rotary kilns, appears on page 94 of this issue.

Important Agstone Notice

According to last minute information, the A.C.P. situation has reached a critical point. All-out efforts are being made by the Benson administration to put through a reduced appropriation which would mean practically the end of the liming program. If these efforts are successful, this would mean support for only about two million tons of liming material, and producers would have to market anything over that amount without government financial assistance. Past experience has shown that decreased support means a sharp drop in demand.

Producers, farmers, and others are rallying to the defense of the A.C.P. program, and their efforts are already being felt; but pressure must be increased if this national calamity is to be prevented. All producers of liming materials, all their employees and customers, and all others interested in the continuation of this program and the health and well-being of our people must enter into the battle and make their attitude known to their congressmen at once, and in no uncertain terms. If prompt action is taken, this program can still be saved.—The Editor.

Monthly lime Report For December, '52, and Year

In 1952 domestic sales of open-market lime nearly equaled the record output of 1951, according to reports submitted by producers to the U. S. Bureau of Mines.

Except for a small quantity (6 to 7 percent of the total reported here) of captive tonnage included to maintain comparability with the annual lime statistics of the Bureau of Mines, the figures in this monthly series are limited to open-market lime. The monthly canvass includes the output of plants whose cumulative production in 1951 constituted 98 percent of the entire open-market lime industry. The table shows sales by types and major uses.

National Gypsum Expands Operations, Buys Plants Of Three More Concerns

Spokesmen of the National Gypsum Company reported that $4,670,399 was spent by the firm in 1952 to complete new plants started in 1951 and to improve and make needed repairs in others. Two important modernization projects were the completion of a new paper mill at Pryor, Okla., and the addition of a rotary kiln for a special processed lime at the Bellefonte, Pa., plant.

In addition, the company acquired Wesco Waterpaints, Inc., including its eight plants, working capital, and experienced staff. Their eastern operations were completely integrated with those of National Gypsum, while the Pacific Coast and Canadian divisions were set up to continue under Wesco Waterpaints, Inc., as wholly-owned subsidiaries. During that part of 1952 after the Wesco operations were added to National Gypsum, sales of the former amounting to $6,567,000 were added to make the total sales of National more than $100,000,000.

In acquiring the Asbestone Corporation in January, 1953, arrangements were made by National Gypsum to borrow an additional $3,500,000 for the retirement of debt carried by Asbestone, for the purchase and for the enlargement of the Buffalo headquarters.

Also acquired in 1952 was the property of Smith Asbestos Products, Inc. This transaction and that involving the purchase of Asbestone together necessitated the issuance of 265,907 shares of common stock in exchange for the plants of these firms. The combined sales of Asbestone and Smith Asbestos Products for the year were approximately $10,700,000.

Asbestone has two modern plants near New Orleans and St. Louis, which sell to the South and West; and Smith Asbestos has an operation at Millington, N. J., which supplies eastern markets.

Lime Sold by Producers in the United States, in 1952, by Quarters, and by Types and Major Uses (Short Tons)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Year
By types:					
Quicklime	1,555,795	1,313,829	1,394,533	1,603,244	5,947,401
Hydrated lime	431,403	503,038	469,505	419,198	1,823,144
Total lime	1,987,198	1,816,867	1,864,038	2,102,442	7,770,545
By uses:					
Agricultural:					
Quicklime	9,610	18,927	18,424	12,907	59,868
Hydrated lime	48,974	73,617	39,749	26,953	189,293
Total	58,584	92,544	58,173	39,860	249,161
Building:					
Quicklime	47,271	55,191	57,374	48,942	208,778
Hydrated lime	206,768	246,096	254,400	213,469	920,733
Total	254,039	301,287	311,774	262,411	1,129,511
Chemical and other industrial:					
Quicklime	978,781	864,511	890,656	1,020,018	3,753,966
Hydrated lime	175,661	183,325	175,356	178,776	713,118
Total	1,154,442	1,047,836	1,066,012	1,198,794	4,467,084
Refractory (dead burned dolomite)	520,133	375,200	428,079	601,377	1,924,789

Approximately 60 percent of lime produced is high calcium and 50 percent high magnesium.

Wage-Hour Chief Reports On Compliance in Plants Of Nonmetals Industries

Violations of the overtime pay provisions of the Fair Labor Standards Act were the chief cause last year of back wage liabilities for manufacturers of stone, clay, and glass products, according to the 1952 annual report of the U. S. Labor Department's Wage and Hour and Public Contracts Divisions. The report, recently released by Administrator William R. McComb, shows that employers in the industry paid $136,676 in back wages to 1,783 employees, as a result of the divisions' activities. This sum does not include amounts awarded to employees who sued in court for back pay and liquidated damages.

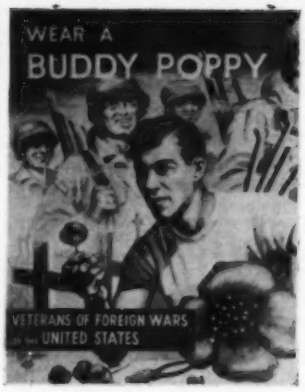
Of the 583 establishments investigated by the divisions during fiscal year 1952, 49 percent were found in violation of the overtime pay requirements. Fourteen percent had failed to comply with the statutory minimum wage. The divisions found violations of the Act's child-labor provisions in 7 percent of the investigated establishments.

This record—and the fact that 54 percent of the investigated establishments had violated one or more of these basic provisions of the Federal Wage and Hour Law—should not be considered representative of compliance by the industry as a whole, however. Efforts are concentrated where complaints have been made or general information indicates that violations will probably be found. Only a small proportion of those establishments covered by the law are investigated.

"These findings should remind all manufacturers of stone, clay, and glass products to make sure they are complying with the Act," Administrator McComb commented. "Most violations were due to mistaken ideas about the Wage and Hour Law's applicability to some of the establishment's employees. Complete understanding on the status of every employee would eliminate the chance of having to make unexpected back wage payments."

The Act's provisions apply to employees engaged in interstate commerce or in the production of goods for interstate commerce. Unless they come within a specific exemption, such employees are entitled to a minimum wage of 75 cents an hour and not less than time and one-half their regular rate of pay for all hours worked in excess of 40 a work-week. The child-labor provisions set a minimum age of 16 years for employment in general and 18 years for jobs which the Secretary of Labor has declared hazardous.

Employers who have questions about the Fair Labor Standards Act will receive a prompt reply by writing to the nearest regional office of the Wage and Hour and Public Contracts Divisions. The regional office for Illinois, Indiana, Minnesota, and Wisconsin is located in Room 1100, 105 West Adams Street, Chicago 3, Ill. Other regional offices are located in Boston, New York, Philadelphia, Birmingham, Cleveland, Kansas City, Dallas, San Francisco, and Nashville.



● Don't forget to buy your V.F.W. Buddy Poppy this Memorial week. Your purchase will help in the great nation-wide rehabilitation and community services of the Veterans of Foreign Wars of the United States. Even the Buddy Poppies themselves are made in government hospitals by disabled veterans, learning new skills to replace the facilities they lost while fighting for you.

U. S. Fluorspar & Manganese Opens Mine After Shutdown

The U.S. Fluorspar and Manganese, Inc., mine at Browns Canon, near Salida, Colo., has been reopened after a four-year shut-down. The mill, which produces material for metallurgy, ceramics, and acids, is expected to be started up within a short time, according to Peter Bancroft, secretary.

Others associated with the corporation include N. J. Nicholson, vice-president; Griffith Annesley, who is in charge of operations; and Gus Gladis.

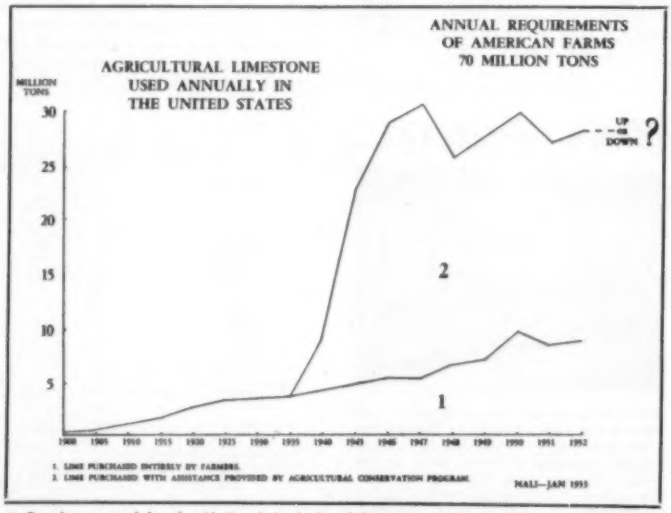
General Portland Cement Shows Highest Net Sales In Its History in 1952

General Portland Cement Company, Chicago, reported the highest net sales in company history for the year ended December 31, 1952, and announced plans to increase its annual productive capacity to 13,000,000 barrels through a construction and installation program scheduled for 1953-54.

Net sales were $29,435,059, as compared with $27,121,019 in 1951. Net earnings after income tax provisions were $4,894,218, equal to $4.71 a share on 1,039,971 shares of common stock outstanding, up from $4,532,439 and $4.36 a share the year before.

Annual productive capacity of Type I Portland cement was increased by 1,250,000 barrels in 1952, when a fifth kiln and related facilities were placed in operation at the company's Tampa, Fla., plant. According to Smith W. Storey, president, capital expenditures for 1953 are estimated at $4,000,000 to cover the completion of Tampa additions, improvements at other plants, and the start of construction at the company's Houston, Tex., plant to increase its capacity by 1,250,000 barrels a year. The Houston additions are scheduled for completion in 1954, he said.

The Buffalo Crushed Stone Corporation, the Federal Portland Cement Company, the Louisville Cement Company, the National Gypsum Company, and the Universal Atlas Cement Company received 100 percent safety awards for their showing during the final quarter of 1952 in the accident prevention contest of Associated Industries of New York State.



● Graph prepared by the National Agricultural Limestone Institute indicates (1) that the Agricultural Conservation Program has had a great effect on the amount of agricultural limestone used annually in the U.S. during the last 17 years, and (2) that current agricultural limestone usage is far below requirements of 70,000,000 tons per year.

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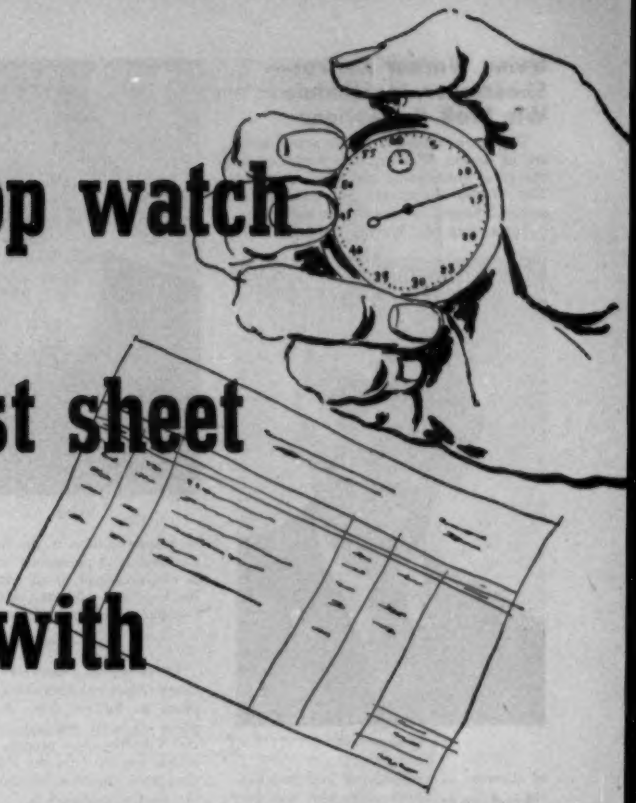

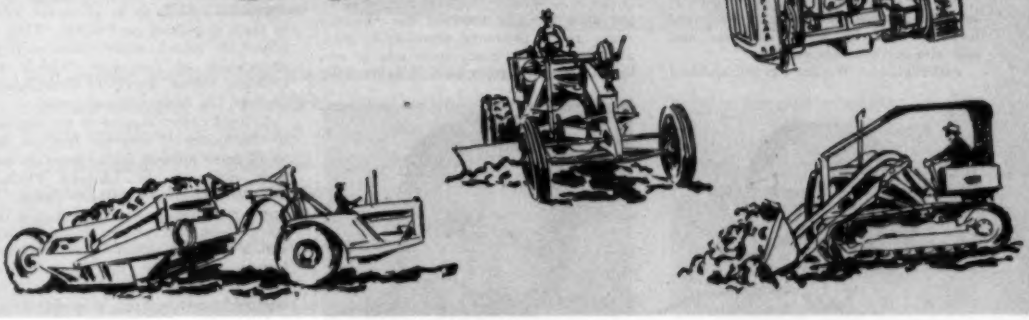

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Irving Warner Retires—Shoemaker, Martindale Win Staff Promotions

The recent retirement from active service of Irving Warner, vice-president in charge of engineering and purchasing for The Warner Company, has resulted in several changes in this department.

Succeeding Mr. Warner (with the title

E. L. Shoemaker

of director of engineering and purchasing), is E. L. Shoemaker, who was formerly chief engineer of eastern operations. Mr. Shoemaker has also been appointed a member of the operating committee, replacing Mr. Warner. In his new duties, he reports to President John Curtin Jr.

Arthur I. Martindale of the Engineering Department has assumed the post formerly held by Mr. Shoemaker and will also serve as his assistant.

Although Mr. Warner has relinquished

Irving Warner

his responsibilities in the Engineering and Purchasing Department, he will continue as vice-president in an advisory capacity. He has been affiliated with the Warner Company for nearly 49 years.

International Minerals and Chemical Corporation has completed a $12,000,000 plant at Bonnie, Fla. Building of the plant on sand was expedited by use of the Vibroflotation process. This process, which was used by the Rust Engineering Company, involves electrically vibrating the sand to compact it.

Feldspar and Mica Plants To Be Built in Tennessee By International Minerals

Construction on new feldspar grinding facilities at Erwin, Tenn., which will increase capacity for finely ground F-4 pottery-grade flotation feldspar by about 50 percent, was announced by Norman J. Dunbeck, vice-president in charge of the Industrial Minerals Division of International Minerals & Chemical Corporation.

Mr. Dunbeck stated that a new mica mill also has been put into production at Erwin. The mill, which will supply a growing market for finely-ground mica in the rubber and paint industry, will be operated under the Newdale Mica Company, a unit in the Industrial Minerals Division's Consolidated Feldspar Department.

The Erwin plants are two of 15 operated by Consolidated Feldspar Department of the Industrial Minerals Division of International Minerals & Chemical Corporation in an area extending from Arizona to Maine, and from North Carolina to Quebec.

Champion Sand-Gravel Co. Sold to Cass Corporation

The Cass Corporation, Essex Junction, Vt., has purchased the sand-and-gravel deposits and the equipment of the Champlain Sand and Gravel Company, Inc.

Included in the purchase were 45 acres of land, a portable crushing plant, a washing plant, a shovel, and other items of equipment. H. E. Warner is president and treasurer of the new firm; Albert Cass is vice-president and secretary.

Material Service's Col. Crown Wins Horatio Alger Award

Colonel Henry Crown, chairman of the board of Chicago's Material Service Corporation, recently received the Horatio Alger award presented annually to men and women who made their way to national eminence from humble beginnings in the manner of Horatio Alger heroes.

A. I. Martindale

Col. Henry Crown

Chosen by 3,000 student leaders from 600 colleges and universities from coast to coast, Colonel Crown was one of 11 American leaders to be given the award in their respective professions. They received the award, made annually by the Association of American Schools and Colleges, from President Eisenhower's brother, Dr. Milton Eisenhower.

Colonel Crown slipped on the first rung of the ladder of success. He was fired at 14 from his first job as assistant shipping clerk at the Chicago Firebrick Company when he made an error. He dispatched two loads of gravel to a contractor who had ordered a load of sand and a load of gravel. Today Colonel Crown knows the difference between sand and gravel. His company is the world's largest building materials firm.

He is also chairman of the board of the Empire State Building Corporation in New York, of the Freeman Coal Mining Corporation of Chicago and St. Louis, and of the Marblehead Lime Company of Chicago. In addition, Colonel Crown is a director of Hilton Hotels Corporation, of the Chicago Rock Island & Pacific Railroad Company, and of the Madison Square Garden in New York.

During World War II he served as a colonel in the Corps of Engineers in charge of buying over $1,000,000,000 worth of supplies. He earned a Presidential citation and the Legion of Merit.

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Australian Stone Producer Visits American Quarries On 4-Month World Tour

A recent visitor in PIT AND QUARRY's office was Cyril H. Reid, J. P., chairman of directors, Reids Quarries Ltd., Essendon, Victoria, Australia. Mr. and Mrs. Reid are on a four-month trip which will take them around the world, with the main objective of seeing the Coronation in London on June 2.

The Reids flew from Australia via Honolulu and other stops, arriving in Los Angeles on March 14. They then came on to Chicago via San Francisco, Seattle, Vancouver, Banff, etc., visiting a few quarries en route. From Chicago they went via Detroit, Toronto, and Washington to New York, making more visits. They planned to arrive in London on April 20 and make a tour of Europe before the Coronation. The return from London to Singapore is to be made by jet plane.

Mr. Reid's company, which is a member of National Crushed Stone Association, is the largest crushed stone producer in Victoria. It operates three basalt quarries around Melbourne, with a combined capacity of 400 t.p.h. He was much impressed by the United States and its quarrying industry and plans to return for a more extensive visit.

Cyril H. Reid

Big Quarry to Be Opened In Upper Michigan Peninsula

Plans for a multimillion-dollar quarry in the Upper Peninsula of Michigan have been announced by the Michigan Limestone Division of U. S. Steel Corporation. It will be the firm's first waterborne source of dolomite on the Great Lakes.

According to plans the quarry will produce 3,000,000 tons a year of dolomite for use in steel production. It will be located on a 10,000-acre site five miles northeast of Cedarville, Mich. A crushing plant will be operated at the quarry, and the stone will be hauled by rail to a screening plant and dock on the lake. The dock will be about 300 ft. long and will accommodate the large self-unloading ore boats which will be used to transport the dolomite to the steel mills. Plans call for opening of the quarry late next year. C. R. Dolsen will be in charge of the crushing plant.

Machine-gun Blast Photos Offered by New Company

A new company has been established to take machine-gun sequence blasting photos at quarry, stripping and construction operations.

Organized as Sequence Photo Service, 705 Tatnall Street, Wilmington 1, Delaware, the new company is establishing branch offices in Chicago, St. Louis, Boston and other major cities so that assignments may be handled quickly and economically.

Sequence Photo Service is equipped with the latest style machine-gun sequence cameras and its operators are experienced in blasting work. The service makes contracts for blast photos with operating companies, seismograph organizations, consulting engineers and explosives suppliers.

Sequence blast photos have been found helpful in analyzing reasons for escaping gases, noise, certain types of breakage, and the effectiveness of various millisecond delay patterns. Three photos a second are taken on a five-inch negative so that enlargements of the different stages of the blast are clear and sharp. Normally there are 10 to 12 photos in each blast sequence.

Rates for the service are $50 for the first blast and $10 each for subsequent blasts the same day. Travel charges must be added to this figure, but the company tries to route various blasts so that this cost does not become excessive.

Information on the new service may be obtained by writing the company. Estimates and tentative scheduling are discussed with no obligation to the customer.

Kentucky Crushed Stone Assn. Elects Bassett President

The Kentucky Crushed Stone Association elected David Bassett, Monticello, president at the annual meeting held in Louisville, on March 15. He succeeds W. E. Covington, Ashland, who became a member of the board of directors.

Other officers are as follows: vice-president, James B. Allen, Winchester; secretary, J. Robert Thompson, Frankfort; treasurer, Miss Margaret M. Smith, Lexington; executive secretary, W. O. Snyder, Frankfort. Directors named were the following: Herman Genet, Greenville; Herb Wells, West Liberty; Emil Berry, Anchorage; Charles Gorman, Flemingsburg; W. B. Paynter Jr., Middlesboro, and R. S. Waters, Elizabethtown.

Canada Crushed and Cut Stone Limited reported a net profit of $225,080 for 1952. Profit before income tax was $464,741. According to R. G. L. Harstone, president, business reached a high volume during 1952, with the exception of the two cut stone plants, where operations lagged because of a steel shortage.

Lone Star's Expansion Ups Virginia Plant Output To 6,000 Bbl. per Day

Construction designed to increase production at the Lone Star Cement Corporation's plant at Lone Star, Va., by 50 percent, to a total of 6,600 barrels of portland cement a day, is proceeding at top speed. The additional facilities are expected to be in production by November of this year.

The favorable reception accorded Lone Star products in this area was the basis of the management's decision in October, 1952, to proceed with the current expansion program, seventeen months after the new mill made its first shipment of cement, in June, 1951. Orders for the heavy machinery involved were placed last November and December, and ground was broken on March 2 of this year.

The new construction involves the installation of a third kiln, complete with air-quenching cooler, which, like the two now in operation, is 340 ft. long and 10 ft. in diameter. These refractory-lined kilns burn carefully selected raw materials at a temperature of 2,800 deg. F., one of the highest temperatures used in any industrial process. Additional coal pulverizing equipment with a capacity of 80 tons a day will provide fuel for the new kiln, increasing the total coal consumption of the plant to 240 tons a day.

An additional 1,000 tons of raw material per working day, consisting principally of limestone and shale, will be required for the enlarged operation, bringing the total raw material consumption of the plant to 3,000 tons a day. Another power shovel is being provided for use in the quarry.

A new finish-grinding unit with an 800-hp. motor and auxiliaries is being installed. To operate the massive machinery in the enlarged plant will require 135,000 kw. hours daily, enough electrical energy to light the homes of a good-sized city.

An efficient dust-collecting system in each of the grinding mill circuits will assure good housekeeping.

Tidewater Construction Company, of Norfolk, is the general contractor for this construction, which consists of additional footings and foundations, extensions to the kiln and feed buildings, and erection and installation of all machinery and equipment.

Kansas Limestone Producers Form New State Association

Representatives from 15 companies met and formed the Kansas Limestone Producers Association in Ottawa, Kans., on March 6.

The following officers were elected: John Riddle, Marion, president; Marshall Carr, Neodesha, vice-president; and Robert Killough, Ottawa, secretary-treasurer. The directors are G. W. Baker, Holton, and John Stark, Girard.

Robert M. Koch, executive secretary of the National Agricultural Limestone Institute, was a guest speaker. Ben Kiefer, Kansas Production and Marketing Administration chairman, also addressed the members.

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This tough layer of shale three to eighteen inches thick, in the limestone mine of the Louisville Crushed Stone Co., has been licked by Preco Back-Rippers.

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With Preco Back-Rippers attached to the bulldozer on a Caterpillar D8 Tractor they now rip out the shale as the tractor backs up... then doze it into a pile on the forward trip.

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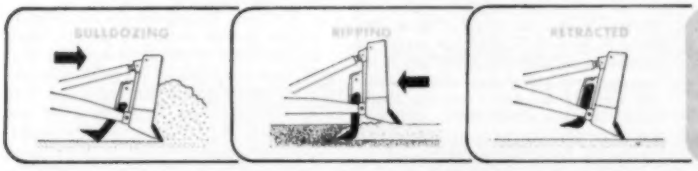
For complete information ask your "Caterpillar" dealer.



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30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE May, 1923, issue of PIT AND QUARRY announced that the distribution of the PIT AND QUARRY HANDBOOK throughout our industries had been completed. Announcement of this new publication had been made in these pages a few months earlier, together with details about the contents. Distribution, as announced, was on the same basis as PIT AND QUARRY at that time, free to every producer in the field, in the United States, and in Canada. Already many letters of appreciation for this valuable book had been received from producers in all areas, from association heads, machinery manufacturers, and others.

The editorial in this issue was on the subject of state cement plants, a topic which it treated in a half-humorous vein. State legislatures, it was said, met too often and stayed in session too long, with the result that they often ran out of things to do. In order to relieve the tedium and at the same time make a hit with the folks back home they introduced bills to build state cement plants. In a more serious vein, however, it was announced that the state of South Dakota, which had been working on a proposition of this kind for a long time, had just arrived at the point of taking bids. These bids were only for the office, stockhouse, concrete stock, and foundations; but, as we all know, this plant was built and is still in full operation.

In New Jersey the governor had just signed a bill authorizing the state highway commission to own and operate a cement plant. This bill was regarded as a protest against alleged high prices and slow deliveries of cement and followed similar action by several other states. In Wisconsin a bill had been passed providing $30,000 for a legislative committee to investigate the feasibility of such a plant, and $40,000 for obtaining an option on a site.

It was stated that in many states this kind of legislation was more or less admitted to be a club with which to beat down the price of cement from the commercial plants. In Illinois this method was said to have lost its intimidating force, if it ever had any, and to have ceased to fool the taxpayers. In Missouri the senate had just struck from a big contingent appropriation bill a revolving fund with which the state highway commission could buy, or obtain through condemnation, cement plants, gravel beds, etc., if necessary should prices become too high. Oklahoma had voted down a bill providing an appropriation of $1,000,000 to build a state cement plant, stating that such a plant would be a continuous burden on the taxpayers. A similar bill had been introduced in Ohio, but as yet no action had been taken on it. In Minnesota there was some sentiment in favor of such a plant.

Features of this issue were three excellent articles on operating problems in the nonmetallic minerals industries, all staff written. One was the fifth in a series of detailed and authoritative articles on blasting. The preceding installments had shown the need for a rule or formula for blasting. Such rules were presented in this article, and it was stated that this was the first time such rules had ever appeared in print. It was to be followed by other papers on the same subject. Another article in this issue, *The Art of Shoveling*, gave much information on the use of hand shovels and the selection of proper types of shovels for different applications. This subject was much more important then than it is in our present highly-mechanized era. There was also another article of a series on the use of cars in pits and quarries.

This issue also contained two good plant operating stories, one describing the interesting new plant of the Old Dominion Sand & Gravel Company at Petersburg, Va., which operated on tidewater deposits. The solutions for recovery problems created by the action of the tides and other unusual operating features of the plant were described. The second operation described was the Blue Ridge Springs, Va., crushed stone plant of the Blue Ridge Quarry Company.

Considerable activity was reported in the expansion of capacity in the cement and other industries. The Pittsburgh Plate Glass Company was reported putting in the foundations for a new 2,500-bbl. cement plant at Fultonham, Ohio, which was expected to be in operation within a year. The National Cement Company was planning to break ground on May 1, 1923, for a new 3,000-bbl. plant in Montreal East, Quebec, Canada, which was to be in operation by the end of the year. This plant was built and was later taken over by the Canada Cement Company. The Southwestern Portland Cement Company with a plant at El Paso, Tex., was reported planning a new 3,000-bbl. plant at Forth Worth; the Riverside Portland Cement Company was incorporated and had plans near completion for a 4,000-bbl. plant at Ainslie, near Macon, Ga. The Texas Portland Cement Company was expanding its plant near Manchester, Tex.

The Eastwood Sand & Gravel Company at Grayville, Ill., was building a new plant and adding barges to its fleet on the Wabash River. The Sisquoc Gravel Pits, Santa Barbara, Calif., had just completed installation of what was called one of the best equipped gravel and sand screening and washing operations on the Pacific Coast. The new plant of the Mid-Coast Rock Company at the same location was reported to be near completion.

Industry conventions played a minor part in this issue. There was a brief report of the annual meeting of the National Slate Association on April 20 at New York. W. S. Ditchett of the Columbia Bangor Slate Company, Bangor, Pa., was elected president. The Ohio Sand & Gravel Producers' Association met at Columbus, Ohio, on March 28. Steps were taken to increase membership. The following new officers elected were: president, F. E. Hall, I. J. Hall & Co., Cincinnati; vice-president, E. A. Evans, Zanesville Washed Gravel Co, Zanesville; secretary-treasurer, F. C. Fuller, Portsmouth Sand & Gravel Co., Portsmouth; executive secretary, Guy C. Baker, Greenville Gravel Co., Greenville.

South African Lime Concern To Develop Big Deposits

As a result of an intensive geological investigation conducted during the last two years by The Central Mining & Investment Corporation, Limited, acting on behalf of The Northern Lime Company, Limited, a company in the Central Mining-Rand Mines Group, a hitherto unknown area of very high-grade primary limestone has been found near Silverstreams, about 100 miles west of Kimberley, South Africa. The results of a borehole drilling program indicate that the quantity of first-grade limestone present on farms over which the Northern Lime company holds rights in the new area is sufficient to satisfy South Africa's entire lime demand for many generations.

The burning method employed at present by principal South African lime producers is confined almost entirely to the vertical-shaft type of kiln in which the coal fuel is intermixed with the limestone feed. This method has been used for the last 30 years by the Northern Lime company at its Taungs property. The company proposes to erect in the near future a modern, highly mechanized lime-burning rotary kiln plant in the Silverstreams area, where the hard physical quality of the limestone is particularly suitable for calcination in the rotary kiln. The Northern Lime company's new unit will be the first lime-burning rotary kiln to be installed in Africa. The planned output capacity of the Silverstreams plant is surpassed at present only by one or two of the largest lime producers in the world.

The company's development program for the Silverstreams area, to be executed in several stages, envisions production during 1954 of one rotary kiln with an output capacity in excess of 100,000 tons of lime a year. This kiln, as well as a substantial proportion of the heavy equipment needed at Silverstreams, will be manufactured in South Africa.

Until the Taungs deposits are exhausted, the present works and the new plant at Silverstreams will be operated in conjunction, to achieve a considerable degree of flexibility in marketing and production. The cost of implementing the first stage of the company's scheme for developing the Silverstreams deposit will be about £1,200,000 (approximately $3,384,000).

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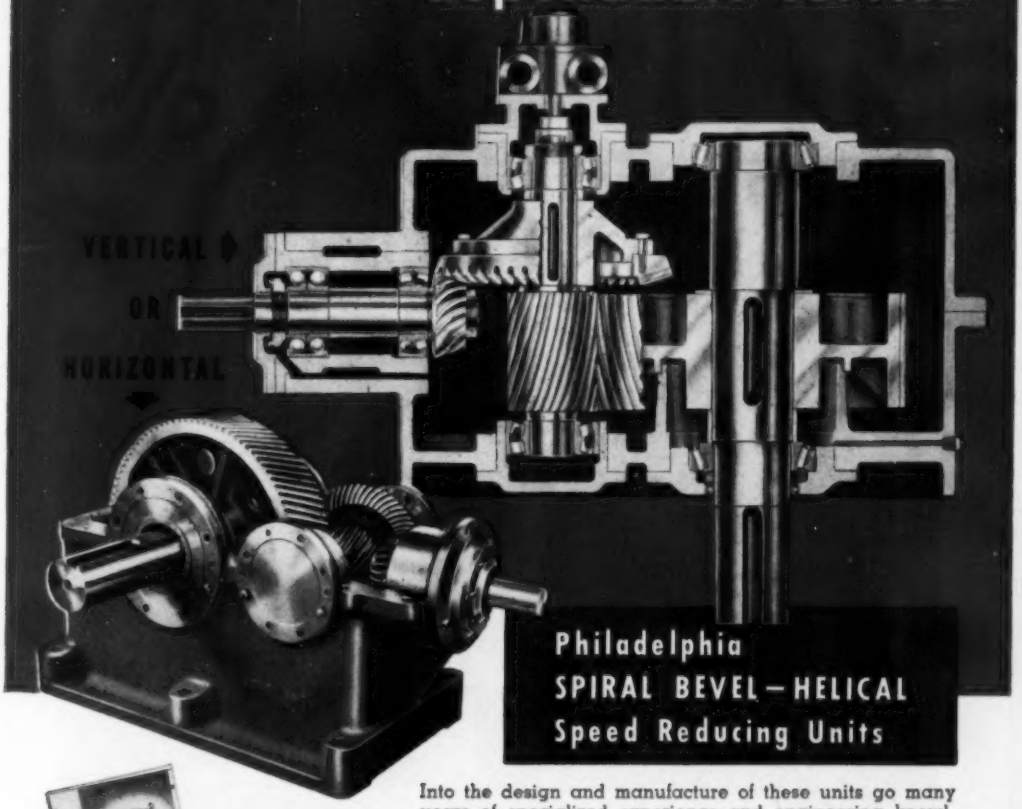

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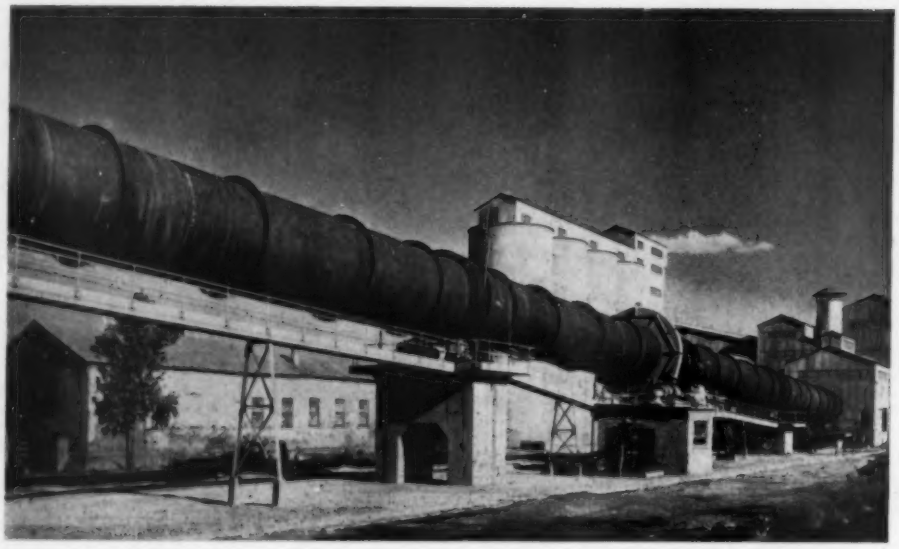

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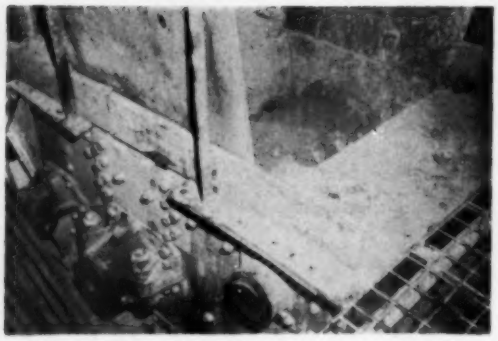
The reciprocating feeder, which discharges quarry-run material into the primary crusher.



View of the 24- by 54-in. toothed-roll primary crusher which is fed by a reciprocating feeder.

laterally. When operating in one direction, the screw discharges over a rail siding adjacent to the plant building; by running it in the reverse direction it may discharge into a waiting truck. In either case, the precise point of discharge may be adjusted by moving the entire screw conveyor. In the case of box cars the actual loading is done with a Stephens-Adamson carloader.

The material-handling setup in the bagging plant is also somewhat unusual. After extensive experimental work with more conventional arrangements for feeding the packers, a multiple-stage system was developed to assure the uniform feed essential for maximum output and accurate weights. The characteristic of the material which caused the most difficulty was its tendency under extreme conditions to repose on an almost vertical face, with the result that there was a tendency either to overfeed, or not to feed the machines at all.

This problem was solved in the manner described below. The material is stored in a 300-ton hopper fitted with six sliding gates, three of which serve each of the two St. Regis 2-spout packers. The three gates in each of these nearly-identical installations discharge the pulverized dolomite into a screw conveyor which in turn delivers the material passing through all three gates into a Jeffrey vibrating feeder. It is the last-named unit which actually delivers the material to the packing machine hopper.

A slat conveyor passing under the operator's station of each machine delivers the filled bags to rubber-tired hand trucks, and the latter are used for wheeling the material into waiting box cars, or into a relatively small storage warehouse. About eight 100-lb. bags per minute can be packed with each machine.

An older plant, built on the Lebanon property during the 30's, is kept in operating condition, and is still used as a stand-by plant. It has a capacity of approximately 18 t.p.h., compared with about 60 t.p.h. for the newer plant. The dryer which serves the smaller plant is 48 in. in diameter by 30 ft. long.

(*Continued on page* 102.)

Top row, left: Firing end of the rotary dryer, showing the oil burner.

Right: Air is drawn through the dust collector and the dryer by this induced-draft fan.

Center, left: Bulk shipments are loaded to the exact desired weight by means of this conveyor weighing device.

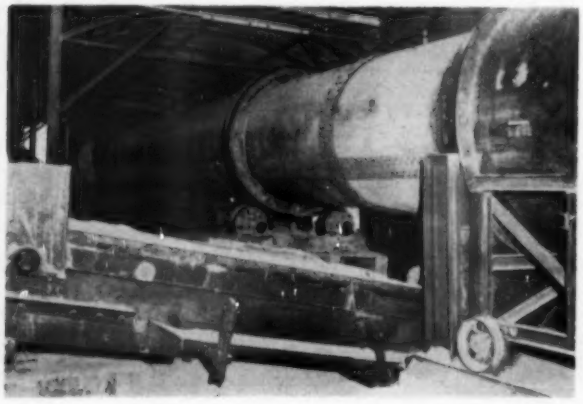
Right: Product is reduced to final size by one pass through the 36- by 48-in. hammermill.

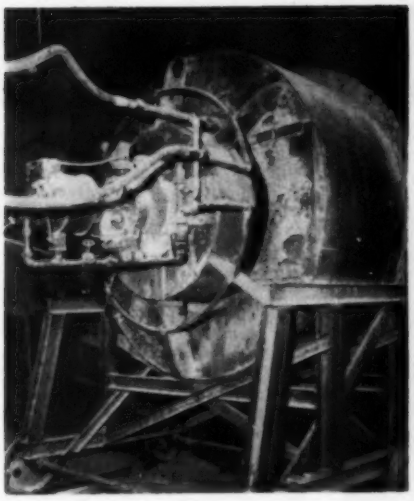
Bottom, left: Screw conveyors below bulk storage bins deliver pulverized material to vibrating feeders, which discharge into supply hoppers over the bagging machine.

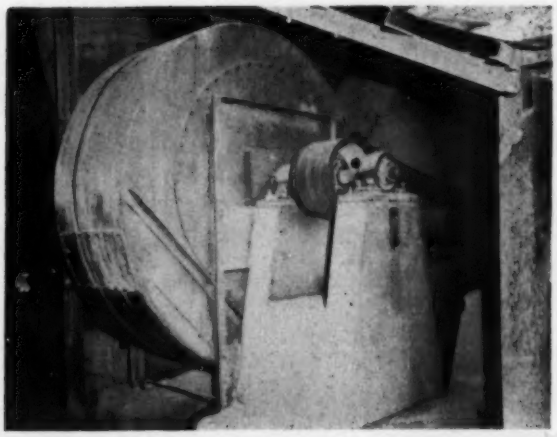
Right: One of the two 2-spout packing machines. Slat conveyor below operator removes loaded 100-lb. bags.

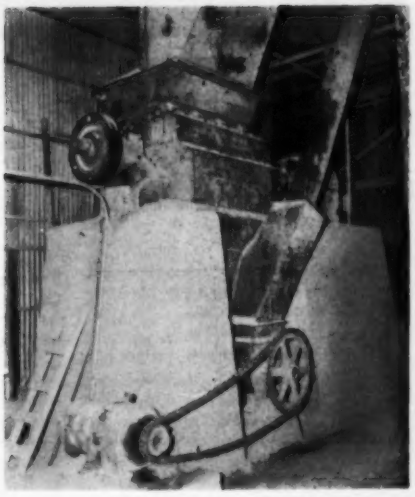
Left: Crushed material is fed from a conical hopper to the rotary dryer by means of a table feeder.

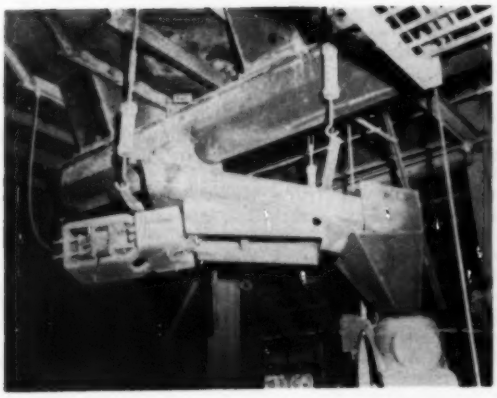
Below: The oil-fired rotary dryer is 5 ft. 6 in. in diameter by 60 ft. long.

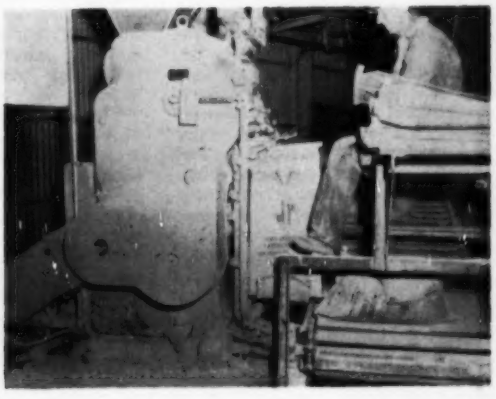












Potash Agstones as Possible Aids To Soil Improvement

Basalt more than 1,000 ft. thick along the Des Chutes River in Oregon.

POTASH agstone, meaning agricultural stone which contains significant amounts of potassium, is currently receiving much serious consideration by both quarry operators and agriculturists. This type of agstone refers to the common, abundant,

By W. D. KELLER
Professor of Geology
University of Missouri

widespread varieties of rock which contain 3 to 10 percent K_2O, such as granite, lava, basalt, green sand, shale, etc., rather than the high-potash, deeply-buried deposits in New Mexico and Texas.

Several operators are now selling large quantities of these common potash rocks, and others are intently surveying the market, preparatory to setting up sales and production programs. It appears that a large demand and market for potash agstone will develop if it is handled on a sound basis. It could easily be oversold by making claims for the material which can not be supported and thereby be given a serious set-back; or it could be unnecessarily retarded if it is not pushed to the full extent of its merits. A sound approach should be followed for the best interests of all concerned.

Rather wide differences of opinion exist regarding the value of potassium-containing rocks as agstone. Therefore the question of their use should best be examined from an objective, middle-of-the-road attitude. We will discuss the problem, examine the results of some recently completed plant tests, and describe the occurrences of various potassium-containing rocks across the United States which are potential agstone producers.

Pros and Cons The arguments for the use of potash agstone are as follows: it is abundant in many localities; it can be produced at low cost; it does not introduce acidity into the soil from prior acid treatment; it supplies potassium, but does not add a chloride ion (chemical) which may impart undesirable properties to a seed bed or soil; and it will last a relatively long time.

Among the arguments against potash agstone are these: it is not economical in terms of the percent K_2O furnished; it is too bulky and heavy; and the potassium in it is relatively unavailable (too slowly available) to plants.

The practical quarry operator is little concerned about the academic aspects of the arguments, but it is obvious that no potash agstone industry can survive if the rock will not furnish potassium to the plants and soil.

If the potash agstone possibilities are as attractive as enthusiastic proponents claim for it, no producer wants to let a pile of by-product rock dust lie unsold, nor overlook a chance to keep abreast of his competitors.

Therefore it does become important to determine which of the conflicting arguments about the use and production of potash agstone are true and sound.

Potentialities This writer will try to resolve the pros and cons about the use and production of potash agstone in a concise summary. First, it should be said that to an unbiased observer each viewpoint has some sound basis for its contention. Indeed, the potash agstone situation resembles in many ways the debate between the relative merits of raw phosphate rock and of superphosphate. The infant potash agstone "industry" is in the same stage that raw phosphate rock (and even aglimestone) was 10 to 30 years ago, when there was a lively debate on the merits of using raw limestone on the soil.

Upon reviewing the facts involved, the following conclusions were arrived at by the writer. They are stated arbtirarily for the sake of brevity and conciseness, and are followed by data to support them.

Potassium can be extracted in usable form by plants and soil (clay and humus) from some potassium-containing native rocks and minerals immediately upon application. This reaction has been demonstrated.

The potash agstone must be finely pulverized, say to 200-mesh. The optimum fineness should be determined by further research and testing. It would appear that appropriate by-product rock dust might be disposed of in a profitable manner.

Some growing plants can probably use, or extract potassium from rocks more readily than others.

Some soils, because of the nature of their acidity, organic matter, or other characteristics, will benefit more from potash agstone than will other soils.

Some potassium-bearing rocks and minerals release their potassium to soil and plants much more readily than do others. More research is needed on this point.

Potassium delivery by the native rock and minerals is slower than by muriate and sulphate. Therefore, relatively larger initial quantities of potash rock should be applied than in the case of the muriate. How much larger the first application should be needs to be determined by

co-operative tests between rock producers and farmers.

A plant needs a balance between the amounts of potassium, calcium, and other nutrients it takes up. There is no need to supply any excess, or "luxury use" by the plant of any one of them.

Less danger of an over supply of potassium exists by the use of potash agstone.

Potash agstone should supply potassium to a soil for a significantly longer time than the more quickly soluble muriate, which is leached away.

No allegedly undesirable chloride ion or acidity is introduced into the soil by the addition of potash agstone.

Numerous other elements, such as calcium, magnesium, sodium, and various trace elements occur in potash agstone and are added with it. These may or may not be very important, depending upon the condition of the soil to which they are added.

The sale of potash agstone should be priced on a basis of chemical analysis—what it contains in terms of potassium, calcium, magnesium, etc., in competition with muriate of potash, other calcium-bearing rocks, etc.

Potash agstone is bulky and heavy, like limestone or raw phosphate rock. Transportation costs will play an important part in the economics of its production.

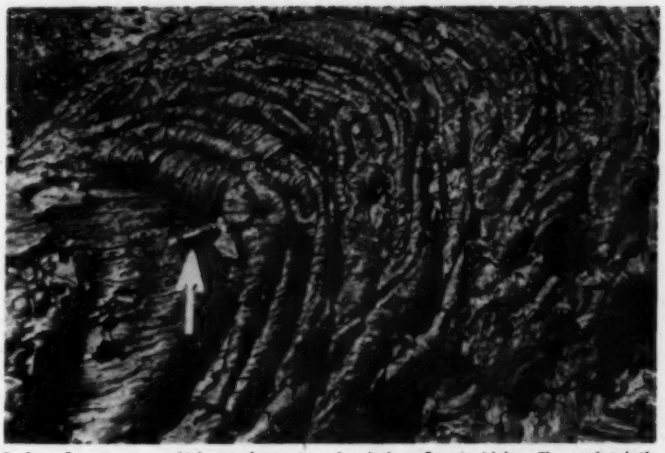
No overly enthusiastic claims which can not be soundly supported should be made for potash agstone. It is no cure-all; there is no mystery or magic about it, its occurrence, or its properties; it is simply potassium-containing rock.

Sound agriculture will probably recommend the use of both potash agstone and quickly-soluble potash salts. The two materials can be thought of as being supplementary, as are raw phosphate rock and superphosphate, limestone and other fertilizer materials.

The economics of production and delivery of potash agstone in fair competition with other sources of potassium should determine its future as an industrial product.

The use of potash agstone will help conserve other deposits of our natural and strategic resources.

Because the potash agstone industry is immature, some careful research should be conducted to develop its possibilities on a substantial footing. On the technical side, for example, the calcining of some rocks, like those which contain crystal or chemical water, will accelerate their solubility. Others may be profitably blended and heated, or treated with weathering or chemical agents. These researches should be carried out by competent and unbiased workers, This writer would like to see several basic research projects supported within educational or research institutions on a non-profit basis. Discussion of the research possibilities is beyond the space of this article.



Surface flow structure which was frozen in a basalt lava flow in Idaho. The pocket knife (indicated by the arrow) gives an idea of the size of the flow structure.

Market research will probably be carried on by individual producers within their natural territories.

With this summary completed, the data upon which the conclusions are based, are next presented.

Potassium Extraction From Rock A question that is fundamental to the use of potash agstone asks whether such stone will truly deliver potassium to a growing plant. The only way to answer the question for certain is actually to try it out with plants.

Such an experiment was sponsored and financed (non-profit) by the Soil and Health Foundation, Allentown, Pa., and was carried out at the University of Missouri under the supervision of Dr. E. R. Graham of the Soils Department, using various potassium-bearing rocks and minerals which were collected by the writer of this article. In other words, the experiment was conducted co-operatively with interests of the rock producer and the farmer shared equally.

A potassium-deficient, rather poor soil was selected from a field in central Missouri for the experiment. Some of it was brought to the laboratory and fertilized in the conventional way with necessary elements, as indicated by standard soil tests, for all elements except potassium. Potassium (K) was then added in the form of various pulverized (200-mesh) rocks as described below, and compared with some of the soil which received no potash treatment, and also with soil treated with highly-soluble muriate of potash (potassium chloride, KCl), and potassium carbonate, K_2CO_3.

Potash was added to the extent of 220 pounds of K_2O per acre of soil (2,000,000 lb. per acre), in individual samples by mixing with the appropriate amounts of pulverized rocks or potash salts. Samples were prepared in triplicate, were placed in glazed earthenware jars, and were planted to Ladino clover. They were placed outside during the normal growing season, and were taken inside the greenhouse during the winter. Experimental conditions were therefore kept under close uniformity and careful control.

Four cuttings of Ladino clover were harvested, dried, and analyzed for potassium, calcium, and magnesium. The two latter are important because potash agstone usually contains some of those elements in addition to the potassium. Detailed records were kept of each cutting and other phases of the experiment.

Among the conclusions expressed by Dr. Graham, the following is taken verbatim: "It is evident that in this soil with a degree of acidity no more severe than that represented by pH of 6.6, the reaction rate between this soil growing the crop and the various minerals was rapid enough to provide significant amounts of potassium in the cases of

The Boar's Tusk, a picturesque mountain of potassium-rich rock in the Leucite Hills of south-central Wyoming.

some of the samples used. In others, the rate was not rapid enough for the growth period as long as 258 days to represent potassium release of significance as far as uptake of this nutrient element by the clover plants would indicate it. Nevertheless, this does not deny the possibility that over longer time intervals and higher degrees of hydrogen saturation of the clay, the less active potassium-bearing minerals may be delivering available potassium for fertilizer service to a growing crop."

These conclusions form the basis for the writer's earlier summary statement that the uptake of potassium from pulverized potash agstone does occur, varying with the plants, the soil, and the agstone applied. It seems entirely logical that the slow availability of some potash agstone could be compensated for by adding larger quantities of it. Since it has been demonstrated that the potassium of native rocks and minerals can be extracted by growing plants, the possibilities are opened for more specific exploration and testing, using rocks available locally and local soils and plants needing potassium.

Just as some soils and plants do not respond to applications of phosphate, limestone, or other fertilizers, it is not to be expected that the situation would be different for potassium-containing rock.

Variety of Rocks Tested Many varieties of rocks and minerals were tested in order to represent as far as possible, rock sources from various geographic locations and various rock types in the United States. The rocks and minerals are listed in Table 1 in the order of their potassium delivery; the plants grown with the treatment at the top of the list contained the most potassium. Those listed below the *No Treatment* line were less effective under the conditions and duration of the experiment than with untreated soil.

Table 1

Treatment Rock or Mineral	Locality or Source	Percent K_2O
Potassium carbonate	Soluble salt	
Potassium chloride	Soluble salt	
Alunite heated to 1300° F.	Marysvale, Uta'i	8.95
Orendite pumice	Leucite Hills, Wyo.	10.76
Lava—orendite	Leucite Hills, Wyo.	9.69
Glauconite heated to 1300° F.	New Jersey greensand	8.25
Granite	Mt. Airy, N. Car.	3.96
Alunite—raw	Marysvale, Utah	8.95
Shale—illite	Fithian, Illinois	4.66
Basalt lava	Arco, Idaho	2.59
No Treatment	**Test Soil**	
Lava wyomingite	Leucite Hills, Wyo.	9.19
Feldspar	Monticello, Ga.	7.47
Lava rhyolite	Arcadia, Mo.	8.45

Unquestionably some of the materials tested would be more potent under other conditions. Certainly potash feldspar (orthoclase or microcline feldspar) should be as effective a source of potassium as granite, because feldspar is the source of potassium in granite. Wyomingite and orendite are close associates in occurrence and mineralogy; therefore, they certainly merit specific tests with other soils and crops than were used in this experiment. Differences in K_2O content in the rocks and minerals were adjusted by adding correspondingly different amounts of rocks and minerals to the soil, as was stated previously.

No attempt was made to determine if and where excessive or "luxury consumption" of any element occurred in any plant. The questions of optimum quantity of potash rock, size of pulverizing, etc., were not treated; the objective of the experiment was to determine whether plants and soil could extract potassium effectively from native potassium-containing rock. The objective was achieved by finding out that under some conditions potassium is effectively utilized and under others it is not.

Quarryable Rocks Containing Potassium The quarry operator is interested in rock occurrences which he can find and from which he can produce a salable potash agstone. In terms of quantity exposed at the earth's surface, basalt, granite, and shale lead the list.

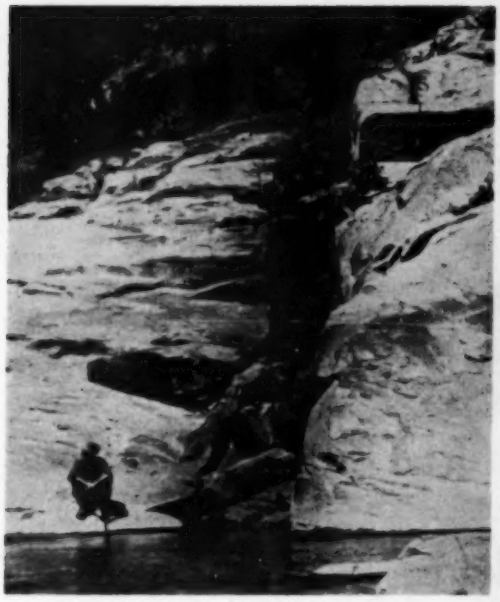
Basalt is a dark-colored, green-to-black, fine-grained igneous or lava rock that occurs in many localities. Varieties of basalt may be called locally trap rock, greenstone, black lava, black dike rock, and other names. Basalt covers hundreds of thousands of square miles in Oregon, Washington, Idaho, and northern California. It occurs elsewhere in most of the Rocky Mountain states, in New England, and down the Appalachians, also sporadically in Texas, Arkansas, Missouri, and about the Great Lakes.

Orendite, orendite pumice, and *wyomingite* may be considered varieties of basalt, lava, or more intermediate rocks. These varieties are especially rich in potash. Equivalent potassium-rich rocks occur in Montana and Arkansas. A quarry operator desiring information about the rocks in his own state should contact his state geologist, or the geology department of the state university.

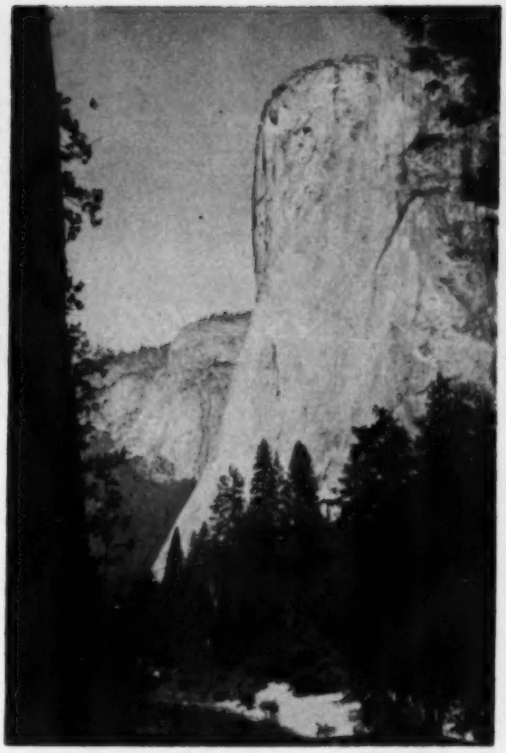
Table 2. Complete Chemical Composition of Rocks and Minerals Used as Soil Treatments

	Illite	Glauconite	Rhyolite	Granite	Wyomingite	Orendite Pumice	Feldspar	Orendite	Basalt	Alunite
Silica, SiO_2	51.47	45.71	72.88	67.33	50.94	53.61	63.19	50.09	43.77	0.69
Alumina, Al_2O_3	19.43	7.21	11.49	18.51	13.14	12.96	22.32	12.76	16.23	36.40
Ferric oxide, Fe_2O_3	6.58	22.95	3.46	1.78	5.51	4.50	0.81	5.15	18.52	0.38
Titania, TiO_2	1.01	0.98	0.39	0.38	2.43	2.70	0.31	2.57	2.92	0.20
Magnesium oxide, MgO	1.75	2.75	0.67	0.41	7.08	5.45	0.07	7.31	3.69	0.64
Calcium oxide, CaO	1.23	1.80	0.40	2.63	6.80	3.73	0.35	6.13	8.13	0.30
Potassium oxide, K_2O	4.66	8.25	8.45	3.96	9.19	10.76	7.47	9.69	2.59	8.95
Sodium oxide, Na_2O	1.65	0.48	1.38	3.60	0.49	3.38	3.58	2.40	2.87	0.42
Ignition loss above 105°C	5.65	6.51	0.64	1.20	2.67	2.11	1.51	2.46	None	15.83
Moisture dried at 105°C	3.09	2.97	0.01	0.14	0.40	0.32	0.01	0.42	0.30	0.17
Manganese oxide, MnO_2	0.12	0.01	0.12	0.12	0.35	0.24	0.24	0.35	0.47	0.01
Sulphur as sulphur trioxide, SO_3	3.12	0.38	0.10	0.01	0.58	0.24	0.01	0.57	0.27	36.05

Analyses by Bruce Williams Laboratories, Joplin, Mo.



A dark basalt dike which cuts across light-colored granite.



Right: A granite (granodiorite) occurrence more than 3,000 ft. high. This is a view of El Capitan in Yosemite, Calif. Although this monolith is protected from quarrying (it is a national park), the Sierra Nevada range, of which it is a part, contains untold quantities of granite and granodiorite rock.

Basalt rock and its variations contain appreciable calcium, magnesium, sodium, and other nutrient elements besides potassium. See Table 2 for the complete analyses of the rocks and minerals which were tested in this experiment.

Granite rock contains feldspar which ranges widely in content of potassium, sodium, and calcium. No close generalization can be made, therefore, about the K_2O content of granite, except that it is ordinarily not very high. Inert quartz, and usually dark minerals like biotite mica and hornblende are also present. The latter may contain potassium, as well as calcium and magnesium.

Granite is common in occurrence. It is found from Stone Mountain, Ga., north to New England, and in Texas, Oklahoma, Missouri, Minnesota, the Black Hills, and in many places across the Rockies, from Colorado to California. Considerable extra weight will have to be handled in producing granite for potassium because of the presence of inert quartz (silica, SiO_2) in granite. Some field tests on farms using granite dust have been reported favorably.

Shale which is rich in *illite* mineral, a potassium-containing clay mineral, is wide-spread in occurrence over much of the United States. Shales vary widely in mineral and chemical composition, from those high in quartz to others like the Fithian, Ill., sample (used in this test) which is potassium-bearing. No generalization on the K_2O content of shale will be attempted; each shale should be examined on its own merits.

Glauconite or *greensand* is currently being produced as potash agstone in New Jersey, Maryland, and elsewhere. It occurs in a band of geologic formations which extend from New Jersey to Texas, and also in large or small quantity in numerous other localities. Local state geologists will know about specific occurrences.

The solubility of potassium in glauconite can usually be accelerated by heating the greensand to a temperature which partially breaks down the mineral structure, but which does not fuse it. A research project along this line and allied trends to explore methods of improving glauconite and illite for use as agstone would appear most promising.

Alunite, a sulphate of potassium and aluminum, with chemical water, is not so wide-spread in occurrence as some of the other rocks and minerals. It has been produced in quantity in Utah, and has been reported at numerous metal mines in the Rocky Mountain region, and in clay deposits elsewhere. Other occurrences of alunite which are known but which have not been reported would be brought to light if a profitable use for it were developed.

Rhyolite, a lava-type rock which is essentially equivalent in chemical composition to a granite, may contain much or little K_2O. It occurs over large areas in the Rocky Mountain states and in Texas, Oklahoma, Missouri, and elsewhere. Although rhyolite did not appear effective as a potassium donor in the Ladino clover test, on theoretical grounds it should be equivalent to the more favorable granite.

Recommendations Possibilities look favorable for the growth of a potash agstone industry if it is soundly developed; and close co-operation between pro-

(*Continued on page* 116.)

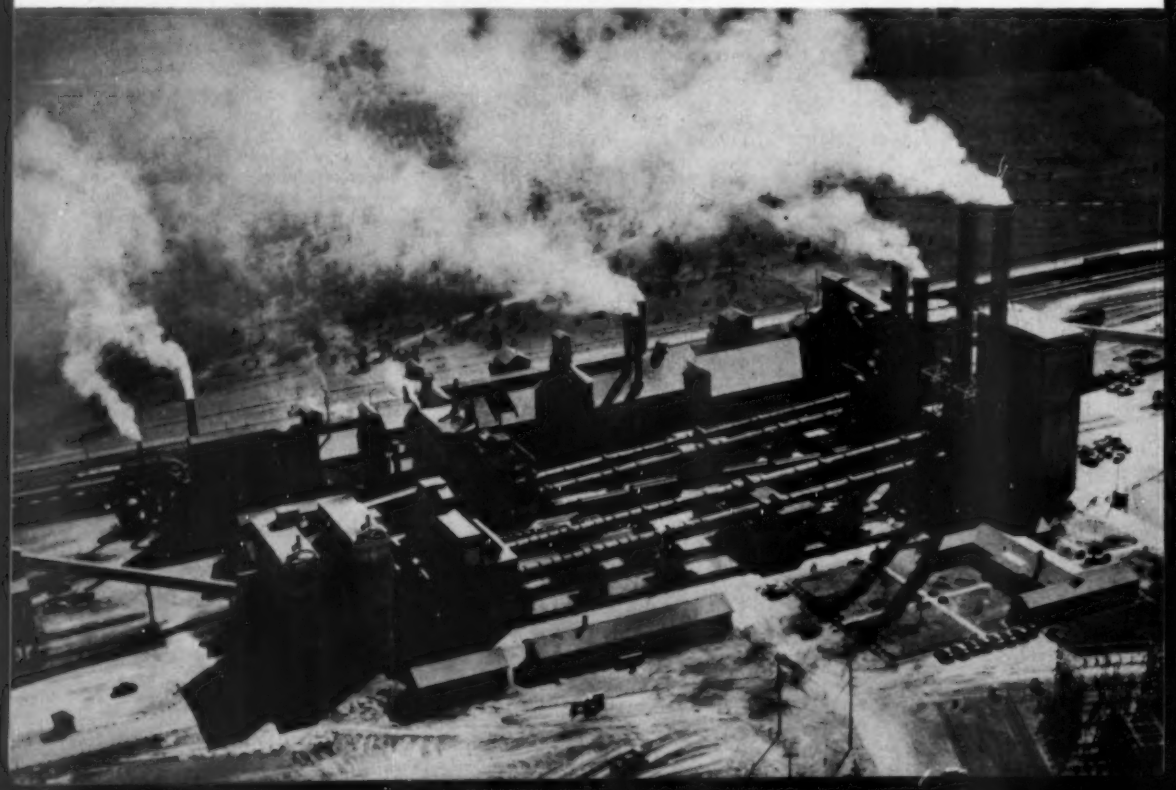
$4,000,000 Expansion at Maple Grove

BASIC REFRACTORIES

installs two 11-ft. 3-in. by 390-ft. kilns--world's largest for making refractory dolomite.

By KENNETH A. GUTSCHICK

Oblique aerial view of the Basic Refractories refractory dolomite plant at Maple Grove, Ohio. Burning plants No. 1 and No. 2 in the building at the rear; two rotary kilns of plant No. 3 in the middle; and two 390-ft. rotary kilns of plant No. 4 in the foreground.



Looking toward the burner building and finished products storage—a close-up of the two new rotary kilns of burning plant No. 4, world's largest rotary kilns for refractory dolomite.

another ON THE SPOT report

FOR many years Basic Refractories Incorporated has been an industrial giant in the production of granular refractory dolomite, a vital material used in the lining of basic open-hearth steel furnaces. Even prior to its most recent expansion program, Basic's plant at Maple Grove, Ohio, was considered the largest operation of its kind in the world. Now, based on the $4,000,000 expansion and modernization program completed last year, the Maple Grove operation is by far the largest refractory dolomite plant in the world, having an annual rated capacity of approximately 900,000 tons.

The expansion program referred to involved the construction of an entirely new and modern burning plant located immediately adjacent to older production units. It was highlighted by the addition of two rotary kilns, which are the largest in the refractory dolomite industry. These kilns, 11 ft. 3 in. by 390 ft. in size, increased the plant's annual capacity by over 300,000 tons. Also included in the program was the construction of a huge concrete stone storage silo, having a capacity of nearly 11,000 tons; and the installation of modern handling and storage facilities for coal and finished product. The program reached its completion when the kilns were started up in July of last year.

Based upon its strategic location at the approximate geographic center of the American steel industry and its enormous production, the Maple Grove plant commands a vast service area, which includes nearly all of the United States, most of Canada and Mexico, and a few overseas countries. Indicative of its leading position in the refractory dolomite industry is the fact that the Maple Grove plant can produce about one-third of the total granular refractories consumed by the American steel industry.

The Maple Grove operation consists of four burning plants, designated 1, 2, 3, and 4. Plants No. 1 and 2 contain three and two rotary kilns, respectively. Some of these units were constructed shortly after World War I, and they were among the first plants in the country to produce refractory dolomite. Besides producing regularly-sized dolomite refractories (trade-named Magnefer), these two plants are also used for the production of a fine-grained refractory dolomite (trade-named Syndolag) and dead-burned magnesite refractories, which are used as ingredients in ramming mixes (trade-named Ramset) and in refractories for application through a gun (trade-named Gundol and Gunmix). Plant No. 3, with two 11-ft. 3-in. by 328-ft. rotary kilns (No. 10 and No. 11), is used chiefly for the production of Magnefer. Kiln No. 10 was placed in operation in 1943 and kiln No. 11 in 1947. Burning plant No. 4 contains the two most recently installed kilns, designated No. 12 and No. 13.

Because of earlier articles published in PIT AND QUARRY*, one

*Trauffer, Walter E. — *Basic Refractories' Crushers Located in Pit 85 Feet Below Quarry Floor Level*, PIT AND QUARRY, June, 1944, p. 68, and Avery, Wm. M. — *Expansion at Maple Grove*, PIT AND QUARRY, May, 1948, p. 82.

View of the primary crushing station on the quarry floor, the stock-out conveyor to the surge pile, and the belt conveyor to the stone sizing plant. The refractory dolomite plant is in the left background.

George E. Stone, chief engineer and acting works manager; A. M. Caito, production manager; and Max Muller, vice-president, operations and engineering.

A side view of the new burning plant No. 4, showing, from left to right, the coal silo, finished product silo, burner building, two rotary kilns, and the raw materials silo.

dealing with the quarrying and milling operation and one with burning plant No. 3, this article will be concerned mainly with the most recent expansion program.

Raw Material The deposit quarried at Maple Grove is an exceptionally high-purity dolomite, which contains approximately 99 percent calcium-magnesium carbonate; it is part of the Guelph formation of the upper Niagara series (middle Silurian age). A typical chemical analysis of the dolomite is as follows:

CaO	30.54%	Fe_2O_3	0.04%
MgO	21.62%	Al_2O_3	0.10%
CO_2	47.40%	P	trace
SiO_2	0.18%	S	0.02%

Detailed geologic investigations made by the company indicate that the quarry is located on the northeast flank of a low-lying northwest-southeast trending ridge; the beds have a slight local dip to the northeast. Because of this structural relation, the deposit of high-purity dolomite thickens slightly to the north and northeast, which is the general direction in which the quarry is being extended. Presently an 80-ft. face is being worked, in contrast to a 60-ft. face of a few years ago. Overburden varies from approximately 3 to 15 ft. in thickness.

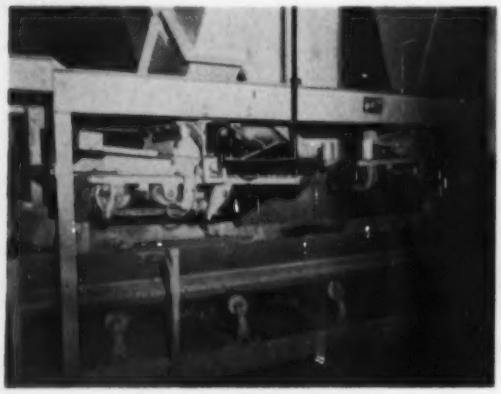
Raw dolomite and mill scale are blended proportionally by constant-weight feeders. Note the bifurcate chute leading to the stone feeder. Kilns No. 12 and No. 13 are each served by six feeders which are synchronized with the kiln rotation.

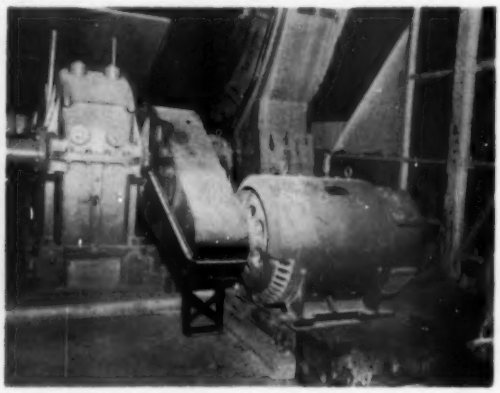
Quarrying Operation Primary blast holes are presently drilled with two Bucyrus-Erie 42T well drills, using 9½-in. bits. Holes are spaced on 28 to 35 ft. centers with a 13 to 15 ft. burden. Generally from 6 to 10 holes in a single row, loaded with 40 percent 9-in. King, Hercules or other dynamite, are shot during each primary blast. The dynamite is detonated electrically with millisecond delay caps; the number and placement of caps varies considerably with each shot. Through the highly successful use of the millisecond delay method of blasting, secondary drilling and blasting has been reduced to the minimum. At present secondary work is handled by two jackhammer men.

Two Bucyrus-Erie 120B electric shovels with 4-cu. yd. buckets, load stone into Basic's fleet of seven Autocar diesel trucks, including four 25-ton units and three 15-ton units, each possessing dual hydraulic hoists. Clean-up work around the shovel is accomplished with an Allis-Chalmers heavy-duty grader and a No. HD-20 bulldozer. Through the use of these two units and the fact that the height of the quarry face is carefully maintained by surveying and precise blasting, the quarry floor is exceptionally level and clean. Careful control of blast hole depth is exercised continuously by the research department.

Primary Crushing Following a ¾-mile haul, the trucks dump directly into an 84- by 60-in. Allis-Chalmers jaw crusher, located below the quarry floor level. The material reduced to minus 9-in. is then gravity fed into a No. 18 McCully gyratory crusher, where it is further reduced to minus 5-in. Then by means of a Stephens-Adamson pivoted bucket carrier and a 36-in. by 338-ft. stock-out belt conveyor, the crushed dolomite is fed to a 27,000-ton capacity surge pile, located on an intermediate level between the quarry floor an the surface. The material is reclaimed from the surge pile through pan feeders onto a 30-in. by 389-ft. belt conveyor which transfers the stone to the mill. The cumulative amount of rock withdrawn from the

A part of the dual kiln drive, showing the 100/125 hp. d.-c. motor driving a speed reducer through a V-belt.





stockpile is automatically recorded by a Merrick Weightometer. At the same time the current rate of withdrawn (t.p.h.) can be read on a large dial scale by the mill operators.

Milling Operation Various sizes of crushed stone are produced in the screening plant, including blast furnace flux stone, coarse aggregate, railroad ballast, two sizes of refractory, stone, concrete sand, and agricultural limestone. The main refractory raw material is No. 6 stone, ranging in size from minus ⅜-in. to plus ⅛-in.; this size is used for Basic's principal product—Magnefer. No. 7 stone (minus .125-in. to plus .05-in.) is used for the production of another important but finer-grained Basic refractory — Syndolag. Tertiary crushing is accomplished by three 4-ft. Symons cone crushers, two being the short-head type and one standard. The fine-sizing screens are equipped with washing sprays; all material smaller than ⅝ in. is washed, including the refractory products. The screening plant has a capacity of 400 t.p.h.

One of the outstanding features of the Basic operation is the relatively large amount of crushed stone produced that serves as raw material for refractory dolomite production. In fact, over 60 percent of the total production is used in refractories. Approximately 50 percent of the total is No. 6 stone.

In the overall quarrying, crushing, screening, and washing operations, no major changes were required as a result of the recent expansion program. The additional demands placed on the quarrying and milling operations by the increase in burning capacity is being met by working those units a total of 15 shifts per week. As a result, monthly crushed stone production at the Maple Grove plant exceeds 200,000 tons.

BURNING PLANT NO. 4

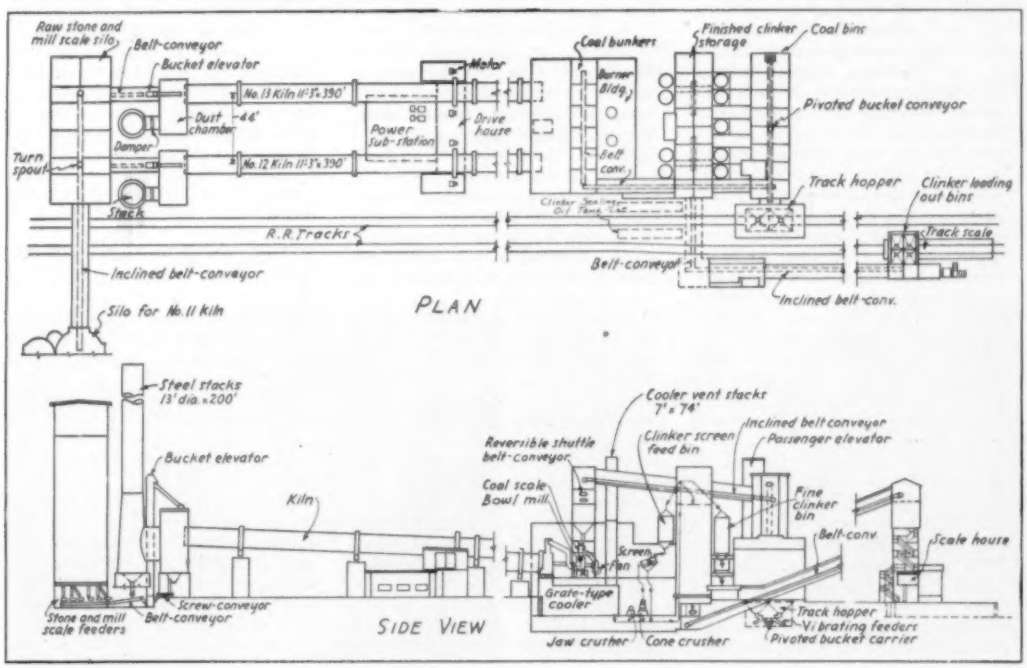
Major units of the new burning plant include the following: the two identical 11-ft. 3-in. by 390-ft. rotary kilns (No. 12 and No. 13) with accompanying Raymond bowl mills for coal and grate-type Fuller coolers; huge concrete storage facilities for raw materials, coal, and finished product; vibrating screens and jaw and cone crushers for the final sizing of the finished product; and truck and railroad car loading-out bins. (See accompanying diagram.) This new unit produces Magnefer, using No. 6 stone and mill scale as the iron oxide additive. Approximately 5 to 10 percent mill scale is used in the blend.

Plan and side view of the new burning plant No. 4.

Raw Material Storage Facilities for the storage of raw materials for the two new kilns consist of a large rectangular concrete silo divided into 12 bins—eight used for No. 6 stone and four for mill scale. Six bins serve each kiln. The silo measures 88 ft. long by 34 ft. wide by 127 ft. high, and is believed to be the tallest stone storage silo in the world. Each dolomite bin has a 950-ton live capacity, while each mill scale bin holds 825 tons, thus making a total storage capacity of nearly 11,000 tons of raw material. The stone silo at the feed end, as well as the coal and finished product silos at the discharge end, were constructed by means of the slip-form technique of pouring concrete (MacDonald Engineering Co.). Progressing at the average rate of 9 in. per hour, contractors erected the stone storage silo in an amazingly short period of eight days.

The new silo is fed by an inclined cross-conveyor belt from the silo serving burning plant No. 3, which in turn is fed by a 735-ft. long, partially underground inclined conveyor belt issuing from the stone mill. Actually this plant No. 3 silo serves as a take-off point for belt conveyors leading to all of the storage facilities of all of the plants.

The cross-conveyor leading to the



An 8-gauge industrial kiln gun, shooting 3-oz. slugs, is used to break up ring formed in the hot zone of the kiln.

A view of the kiln control panel for instruments which raw materials and coal feed, stack damper, kiln rotation, etc.

new stone silo consists of two sections—first a 30-in. by 120-ft. unit, driven by an Allis-Chalmers 30-hp. motor, which leads to the first six bins of the silo (serving kiln No. 12) and second, a 30-in. by 50-ft. unit, driven by a 10-hp. motor, which leads to the six other bins. Material is directed to the proper bins by means of turn spouts located at the end of each bin. These cross-conveyor belts, which have a capacity of 510 t.p.h., are equipped with solenoid brakes, as are all other belt conveyors in the new burning plant.

Each of the new kilns has separate facilities for blending and feeding the raw materials. The materials are blended proportionally by means of six Hardinge constant-weight variable-speed feeders in each kiln circuit, including four type C units used for stone and two type B units used for mill scale. To compensate for segregation in the stone bins, the stone feed to each feeder is drawn from two bins simultaneously rather than from only one. The larger feeders (Type C) utilize a 26-in. belt and are rated at a maximum of 25 t.p.h.; the mill scale feeders utilize a 12-in. belt and are rated at 2.5 t.p.h. The feeders are synchronized with the speed of kiln rotation from the kiln operator's panel board. However, another panel board located on the feeder floor allows for individual control of the various feeders, as well as the units for conveying the blended materials to the kiln.

The combined raw materials are conveyed to the kiln via a 20-in. by 50-ft. belt conveyor, an 80-ft. bucket elevator (with 14- by 7-in. buckets) and a special electro-alloy heat-resistant steel 12-in. feed pipe. The conveying units are rated at 60 t.p.h. In order to prevent freezing of the bucket elevator and feed pipe during severe weather, heat is piped from the kiln dust chamber to the top of the elevator. To facilitate the rapid replacing of the alloy steel feed pipe whenever required, Basic has constructed a steel superstructure, equipped with an electric chain hoist, on top of the dust chamber. Dust is reclaimed from the steel stacks and the dust chamber, via short 9-in. screw-conveyors and is fed to the kiln via the bucket elevator and feed pipe referred to earlier.

Kiln The two new rotary kilns, No. 12 and No. 13, are 11-ft. 3-in. by 390-ft. in size and welded throughout; they are the natural-draft type, and were designed and furnished by the Allis-Chalmers Manufacturing Company. The steel shells are ⅞ in. thick throughout except at those areas where the riding rings are attached, where they are 2 in. thick. The last 2½ ft. of kiln length at the discharge end is made of ⅞-in. stainless steel alloy plate; alloy steel castings also form the nose ring.

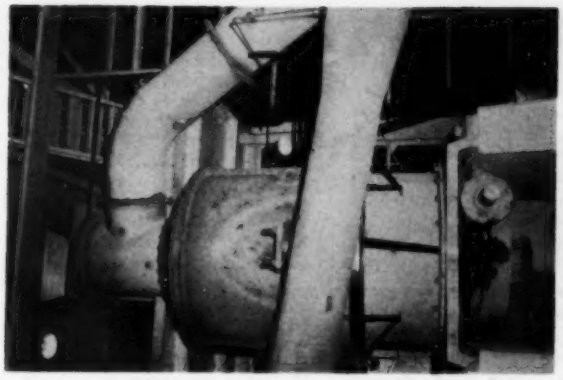
The kiln shell rides on six heat-treated cast-steel riding rings or tires, each having a 172-in. o.d., a 26-in. width, and a 143-in. i.d. The rings are the floating type and of box section design. Filler bars, numbering 36, are welded between the inside diameter of the tire and the kiln shell in order to allow for the difference in expansion between the bars and the shell. Retaining rings are in turn welded to the filler bars in order to keep the tires in place. In addition, each kiln has 19 reinforcing rings, made of 2½- by 8-in. bar, welded to the outside shell. These rings progressively increase in number toward the firing end of the kiln. In fact, 14 of them are positioned on the lower half of the kiln, where the heat is necessarily greatest.

Each tire rides on two 26-in. wide by 54-in. dia. steel rollers, which are mounted on 16-in. dia. solid forged steel shafts. The bearings are water-cooled and are carried in cast pedestals supported on a steel base. The kilns are equipped with a single thrust roller, located at one of the middle bearing positions. Each kiln is set on a pitch of 9/16 in. per ft., and the feed end is approximately 18 ft. above the discharge end.

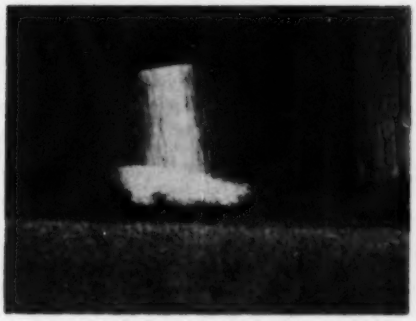
The kilns are lined with various types of brick, beginning with a 70 percent alumina brick at the nose end. An 80 percent alumina brick is used in the adjacent cooling zone. In the following 90-ft. hot zone, a Basic magnesia-chrome brick manufactured at Maple Grove, is used. The next 90-ft. section is again a high-alumina brick; and the remaining 200-ft. section uses a super-duty fire brick.

Each kiln is rotated by a dual drive, consisting of two 100/125-hp. 230-v., d.-c., variable-speed, 400/-1200 r.p.m., Allis-Chalmers motors, each driving a separate speed reducer through a V-belt drive. The reducer, in turn, drives the kiln pinion shaft through a flexible coupling. The pinions, which are meshed ½ pitch from each other, engage the main kiln ring gear and provide continuous driving force.

The V-belt drives connecting the motor with the reducer are Allis-Chalmers units and consist of nine size D V-belts; the reduction produced is 2:1. The speed reducers are Jones No. 490-DH double reduction types with herringbone gears; the reduction is 31:41:1. The flex-



Each kiln has a bowl for pulverizing the coal used in firing. The duct leading to the pulverizer from the kiln hood preheats the coal to 180 deg. F. The burner pipe is in the center.



This unusual photograph shows hot clinker being discharged onto the 7-ft. by 45-ft. inclined grate-type cooler. Note the firebrick lining of the cooler.

ible coupling, between the speed reducer and pinion shaft, is a No. 240F Falk for 9-in. dia. shaft.

The total reduction from motor to kiln girth gear is 798:1. Through use of this intricate drive mechanism, the kiln rotation can be adjusted between 30 and 90 r.p.h. Under normal operation the kiln motors operate at 200 amperes.

The stand-by drive consists of an Allis-Chalmers gasoline engine driving a Jones speed reducer, which in turn is connected to the high-speed shaft of one of the regular drive Jones reducers by a jaw clutch, Through this auxiliary drive, the kiln can attain a maximum speed of 7 r.p.h.

The entire kiln drive mechanism for each kiln is housed. The kiln drive also operates a 15-kw. a.-c. generator, which supplies power for the Hardinge feeders and synchronizes the feeder with the kiln rotation.

Both kilns are served by 13-ft. dia. by 215-ft. high steel stacks, which are lined with haydite concrete made with Lumenite cement. Poured by the slip-form technique, as in the construction of the silos, the lining is 6 in. thick for the first 50 ft. and 4 in. thick for the remainder. Because of their great height, the stacks are illuminated with floodlights to meet the requirements of the Civil Aeronautical Commission.

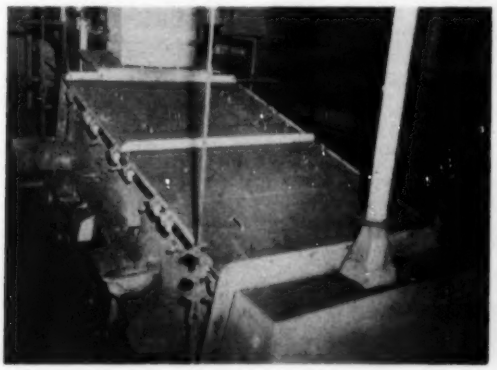
Each kiln unit possesses a firebrick-lined dust chamber and breaching chamber, which are located between the stack and the kiln. The kiln draft is adjusted by a vertical curtain-like stack damper, made of a heat-resistant alloy steel and located in the breaching chamber. (See diagram.) The damper is regulated easily by the kiln operator from the kiln control panel board.

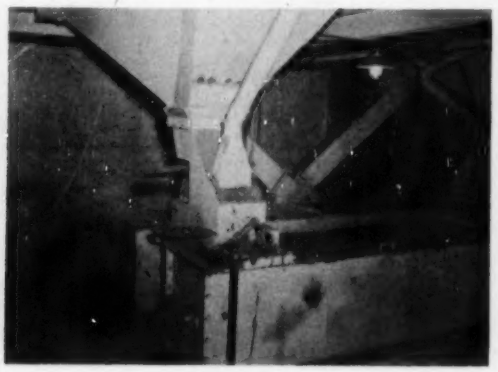
Ring formations which occasionally form in the rotary kiln's hot zones are broken up by means of a Remington 8-gauge industrial kiln gun, using 3-oz. slugs. A Western Cartridge Company 8-gauge kiln gun is used to shoot the cooler, which on extremely rare occasions becomes clogged with oversize clinker. The writer was very fortunate during his visit to witness the shooting of both the kiln and cooler.

Burning Both kilns are fired with pulverized coal, attaining a temperature of approximately 3,100 deg. F. in the hot zone. The coal used at Basic's plant is a low-to-medium volatile bituminous, nut-size coal (1½ in. to 0) obtained from West Virginia; it has a heat value of 13,000 to 14,000 B.t.u's. and is pulverized in a Raymond No. 533 Bowl mill, driven by a 150-hp. Allis-Chalmers induction motor. This mill has a capacity of 7.15 t.p.h. Coal is blown into the kiln through a 15-in. mild steel burner pipe by a Raymond Bowl mill exhaust fan, which is driven at 1165 r.p.m. by a 75-hp. Allis-Chalmers motor. The coal is heated in the bowl mill by heat drawn from the kiln-hood; its temperature is approximately 180 deg. F. upon entering the coal mill. Coal feed to the pulverizer is electronically regulated and also weighed by a

This enclosed 4- by 8-ft. vibrating screen is one of four similar screens used to size the finished refractory dolomite product. Oversize clinker is recrushed and then recircuited to the screens.

Properly sized clinker is given an oil sealing coat in this 18-in. by 20-ft. mixing paddle conveyor, which is located immediately beneath the vibrating screen.





Richardson Model EE coal scale.

Coal Handling Burning plant No. 4 possesses its own coal-handling facilities. The coal is unloaded from hopper cars at a partially enclosed hopper house into two 22½-ton track hoppers. A Webster car shaker attached to a Chisholm-Moore hoist facilitates unloading. During the winter operation frozen cars are thawed out by means of a specially-built thawing pit equipped with Hauck oil burners. From the track hopper, two Jeffrey No. 4D 30- by 60-in. vibrating feeders transfer the coal to a 24- by 36-in. Stephens-Adamson pivoted bucket carrier. Driven by a 25-hp. Louis Allis motor at a maximum rate of 90 t.p.h., the bucket carrier conveys the coal either directly to the 16-bin concrete storage silo or to an inclined cross-belt-conveyor leading to the six coal bunkers in the burner building. Total storage capacity of the 16-bin silo is 1,930 tons and that of the coal bunkers, 360 tons.

Coal is fed to the various bins of the silo through the use of a travelling tripper operated in conjunction with the pivoted bucket carrier. It is reclaimed from the silo to the bucket carrier via three 24-in. portable belt feeders. The inclined cross-conveyor mentioned above is a 24-in by 110-ft. belt equipped with a magnetic pulley; it is driven by a 5-hp. motor. Coal is transferred from this unit to another 24-in. cross-conveyor and then to either of the six coal bunkers via a 30-in. reversible shuttle belt conveyor. Twelve-inch screw conveyors are then used to transfer the material from the bunker to the scale over the bowl mill. Each steel coal bunker is equipped with a Syntron Model V-200 electric vibrator.

Cooling After burning, the "dead burned" dolomite from each kiln discharges onto a Fuller No. 744 inclined grate-type cooler measuring 7 by 45 ft. in size. Air is blown through the grates and the clinker bed by a New York Blower Company Type ME 600 fan. Driven at 967 r.p.m. by a 200-hp. Louis Allis induction motor through a 10 V-belt drive, the fan is rated at 68,400 c.f.m. The cooler supplies approximately 70 percent of the air consumed in combustion during the burning. The remainder of the heated air from the cooler passes out through a Venturi-type stack.

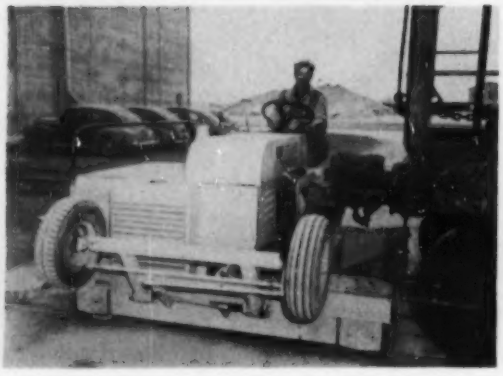
Clinker Handling The refractory dolomite granules, after cooling, are discharged into the two middle compartments of a four-

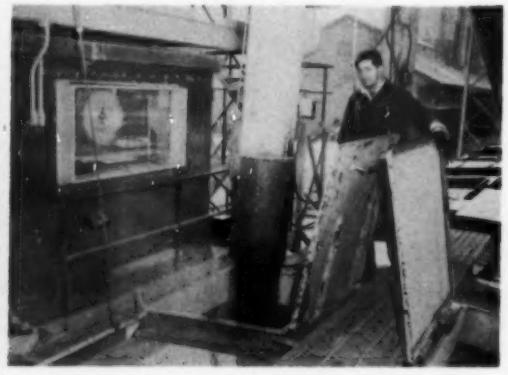
A four-compartment pivoted bucket carrier is advantageously used in clinker handling. Outer compartments convey the finished product to storage, while the middle one takes unsized material to surge bins over the screens.

Oversize clinker is reduced to minus 3/8-in. in this 2-ft. cone crusher.

Below, left: Railroad cars are spotted on a track scale by means of this gasoline-powered car mover.

Below, right: Scene at the track-scale house, showing the simultaneous loading and weighing operations.





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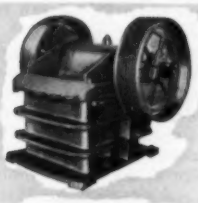
You, too, can look to Lippmann with confidence for the finest of equipment to meet your needs — for individual crushers, feeders, screens, pulverizers or conveyors — or for complete plants. Lippmann Engineering Works, 4607 West Mitchell Street, Milwaukee 14, Wisconsin, U. S. A.



JAW CRUSHERS

Sizes up to 36 x 48 inches. Features 25% more crushing area, non-choking construction, maximum output, minimum power use and maintenance.

GYRATORY CRUSHERS

Revolutionary gyratory operation results in lighter weight, less power consumption, reduced maintenance and controlled product size. Sizes 25 to 72 inches.

ROLL CRUSHERS

Offer real economy in secondary crushing. Exact product size control; tapered roller bearings; a variety of shell face patterns available; easily replaceable wear plates reduce maintenance. Sizes up to 72" x 24" rolls.

CONVEYORS

Complete line of both portable and stationary conveyors of the famous Lippmann design is available. The portables have all the outstanding features of the Lippmann Stationary conveyor line with the additional advantage of wrap belt drive for greater transmission of power. Shorter wheel base permits higher stock piling.

APRON FEEDERS

LIPPMANN makes apron feeders and plate feeders to meet all feeding requirements. Every design has been thoroughly proven by rigorous field service and built for long wear and low power requirements.

SCREENS

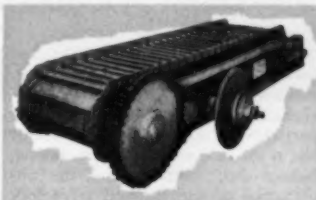
Vibrating screen pictured is positive eccentric type with equally distributed vibration for maximum capacity. Vibration contained in screen body entirely. All sizes, single and multi-deck.

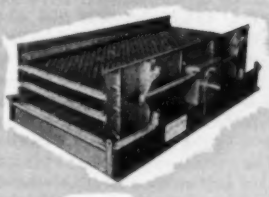
BELT IDLER

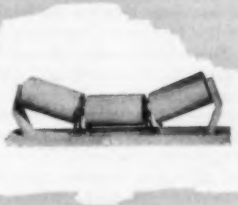
This new Lippmann conveyor belt idler is stronger and more ruggedly designed than the ordinary idler. It is roller bearing design and can be supplied in either the greased type or permanently lubricated. Its all steel, all welded special design makes it a leader in the field.

PULVERIZERS

An unusual design of hammer-type crusher with unmatched records of capacity, product size and quality control, low first-cost and ease of maintenance. Manganese hammers, forged hammer arms and other outstanding design features. Sizes up to 40" x 38".







4607 W. Mitchell St.

LEW **LIPPMANN**

CRUSHERS FEEDERS SCREENS CONVEYORS ELEVATORS HOPPERS BINS

compartment Stephens-Adamson pivoted bucket carrier, and conveyed to a battery of four clinker-screen-feed steel bins, each having a capacity of 78 tons. Discharge from each bin is effected by a 20-in. belt feeder, the material passing to a 4- by 8-ft. Type F-300 vibrating Ty-rock screen equipped with ¾-in. by ⅜-in. slit openings. Each screen is enclosed and fitted with a dust collector. Oversize from the screen is fed to a 2-ft. standard Symons cone crusher for fine reduction; this unit, driven by a 30-hp. motor, is operated in closed circuit with the screen. Operated in conjunction with the cone crusher and located next to it is a 10- by 16-in. Telsmith jaw crusher, driven by a 15-hp. motor. This crusher reduces exceptionally large-sized clinkers coming off the cooler grates, which are generally shoveled into it.

Granules passing through the Ty-rock screen are discharged into an 18-in. by 20-ft. mixing paddle conveyor of Webster design. Here the particles are thoroughly treated with No. 6 oil in order to retard slaking, reduce dust, and improve the appearance of the finished refractory product. This heavy-type fuel oil is stored in two underground 8,500-gal. tanks located adjacent to the burner building and is pumped to the pug mill by a Northern Ordnance gear pump. Oil is used at the average rate of ½ gal. per ton of product.

The four-compartment pivoted bucket carrier used in clinker handling allows three types of material to be handled by a single conveying system. The outer compartments receive properly sized and oiled granules from the pug mill, which are then conveyed directly to the storage silo. The two inner compartments receive material from the cooler, the jaw crusher, and the cone crusher—products which are conveyed to the screen feed surge bins and thence to the Ty-rock screen for final sizing.

The finished-product storage facilities consist of a 16-bin concrete silo, having a total capacity of 4,240 tons, and five 100-ton steel bins for truck loading. The latter units are located immediately adjacent to the concrete silo. The finished product is fed into the various storage bins by means of two 20-in. reversible shuttle belt conveyors, each capable of handling 40 t.p.h.

A major feature of burning plant No. 4 is that the new unit has its own track loading-out bins and track scale. This feature facilitates rapid car loading and weighing out, in contrast to Basic's other track scale, which handles finished product from the three other burning plants, as well as raw dolomite from the stone plant and agstone plant.

Finished clinker is reclaimed from the huge storage silo by three 24-in. S-A variable-speed traveling belt feeders, which feed a 30-in. by 12-ft. belt conveyor driven by a 5-hp. Allis-Chalmers motor. The conveyor, in turn, feeds a 24-in by 230-ft. inclined covered belt conveyor, which then discharges into the track loading-out bin. Both conveyors have a capacity of 330 t.p.h. The inclined belt conveyor has an unusual drive consisting of two 20-hp. motors through a tandem pulley arrangement.

The track loading-out facilities consist of two 110-ton steel bins, each emptied through two air-operated spouts. The cars are weighed on a 67-ft. 150-ton Fairbanks-Morse springless track scale, equipped with a double-face dial. The finished product is shipped out in covered hoppers, box cars, and container cars.

Typical properties of Magnefer, produced in burning plant No. 4, are as follows: grain size, minus ⅜-in. plus 20-mesh, with 92 percent retained on ⅛-in. opening; bulk density, 117-120 lb. per cu. ft.; specific gravity, 3.5; porosity of granules, 9 to 10 percent; MgO, 37.6 percent; Fe_2O_3, 7.4 percent; SiO_2, 1.0 percent; and Al_2O_3, 0.5 percent.

The service area of the Maple Grove plant is among the largest of any nonmetallic mineral operation in the country, for it includes not only the entire United States but also parts of Canada and Mexico and a few South American countries. Nearly every American producer of steel using the basic refining process uses some Basic refractories produced at Maple Grove. A minor exception to this statement would be Western steel plants; however, these plants obtain granular refractories from Basic's magnesia refractories plant located near Gabbs, Nev. Whereas domestic shipments are principally handled by bulk rail carriers, products destined for overseas are loaded in 55-gal. heavyweight steel drums or waterproof bags.

Also indicative of the vast scale of operation of the Maple Grove plant are the following statistics: quarry production attains 2,500,000 tons annually, and refractory dolomite production approximates 900,000 tons annually. More than 250,000 tons of coal are consumed by the four burning plants each year. Finally, more than 25,000 rail cars are handled every year.

The engineering for burning plant No. 4 was done by Basic's well-staffed engineering department. Kilns No. 12 and 13 were designed and furnished by Allis-Chalmers Manufacturing Company. The construction of the entire new burning plant was done by the MacDonald Engineering Company; the kilns were erected by the Toledo Cartage Company under contract to MacDonald.

Supervisory personnel directly concerned with the Basic operation at Maple Grove include the following: Max Muller, vice-president, operations and engineering; George E. Stone, chief engineer and acting works manager; A. M. Caito, production manager; W. C. Knoblaugh, assistant plant engineer; E. P. Pearson, director of research; E. Addis, burning plant superintendent; and H. C. Bonnell, quarry superintendent.

Ground Dolomite

(*From page* 88.)

All of the output of the Lebanon plant is used for agricultural purposes, and all of it is sold by Dolomite Products, Inc., of which Mr. Palmer is also president. The plant at Lebanon requires about 15 men for normal operations, and quarry and haulage work are handled by a crew of eight. Both the plant and the quarry are usually operated 10 hours a day. R. M. King is superintendent, and W. A. Steagald is assistant superintendent.

As indicated at the outset, another plant in Florida produces a material very similar to the product made at Lebanon, and also utilizes the same marketing organization. We refer to the Sarasota mill of the Florida Dolomite Company, which is owned and operated by S. D. Gooch; his sons, W. R. Gooch and S. D. Gooch Jr.; W. H. Stuart; and J. R. Stuart. It is our understanding that the two mills are quite similar, except that the Sarasota operation is supplied from a dry quarry, utilizes a hammermill for primary crushing, and incorporates a surge pile. The two mills are said to have a combined annual production of around 400,000 tons.

Production of portland cement by Canadian manufacturers in February increased to 1,630,483 bbl. from 1,409,966 in February, 1952, and the total for the first two months of 1953 advanced to 3,114,630 bbl. from 2,763,181 a year earlier, according to the bureau of statistics.

Design and Operation of a New High-Calcium Lime Hydrating Plant

By R. S. ADAMS
Plant Manager
Gypsum, Lime & Alabastine, Can. Ltd.
Beachville, Ontario

The hydrate plant building and truck loading facilities of Gypsum, Lime & Alabastine, Canada Ltd. at Beachville, Ontario. At the right is the lime plant.

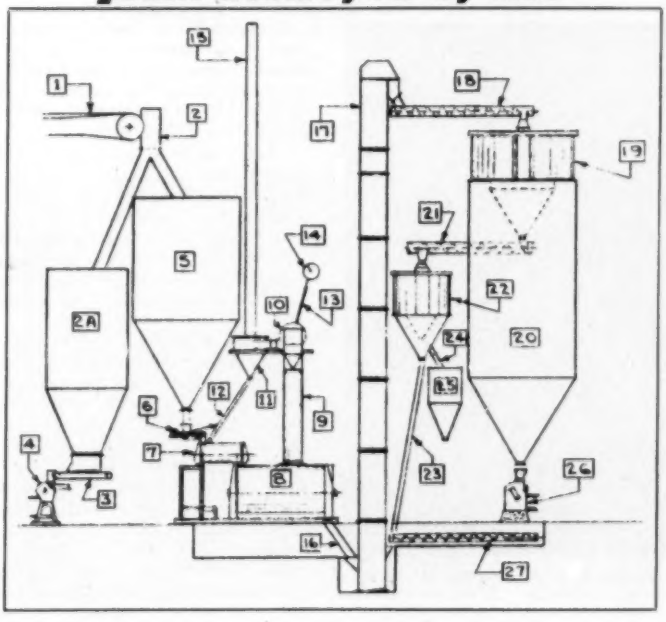
WHEN our hydrate plant and its equipment were totally destroyed by fire in 1951, we were faced with two problems: keeping our customers supplied until a new plant was built and (2) selecting a modern hydrating system, and design and building the same with the least possible delay.

The first problem was solved by shipping our quicklime to another one of our plants some 80 miles away, where it was hydrated and bagged. The finished goods were shipped to our customers, who proved very co-operative during the time of rebuilding.

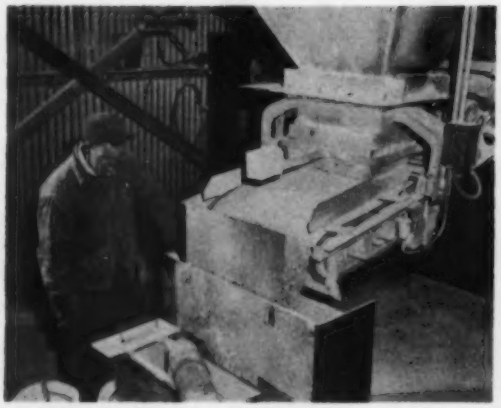
The second problem, that of selecting the best type of plant, was given serious consideration. J. H. Robinson, our general works manager, and others vitally concerned in the operation of the plant, carefully studied various types of hydrating equipment. The Knibbs system was finally selected, as it guaranteed all the main requisites for the new plant, namely: (1) 10-t.p.h. capacity; (2) the quality desired in the finished product—fineness and freedom from unslaked lime; (3) the least amount of machinery to produce the required product at the least cost; (4) minimum amount of room to house the equipment and still give room for further expansion; (5) low operating costs, both in tons per man-hour and horsepower; (6) and cleanliness around the machines and inside of the building, with the minimum of dust exhausted to the atmosphere—one of the very important features.

After the blueprints of the hydrating, conveying, and separating machinery were received from the Holbeck Corporation, Toronto, Ontario, the American agents for Dr. N. V. S. Knibbs, our engineering department designed an 88- by 24-ft. fireproof building of varying roof heights to house the above equipment, as well as the needed storage

Modern operation replaces plant destroyed by fire



Side view of hydrating and bagging units, showing the following: (1) 18-in. belt to quicklime bins; (2) bifurcator spout; (2A) pulverized quicklime bin; (3) belt feed to packer; (4) belt packer; (5) hydrator quicklime supply bin; (6) weighing feeder; (7) premixer; (8) hydrator; (9) exhaust stack; (10) washer preheater; (11) collector cyclone; (12) hot milk lime to premixer; (13) feed water to fan and premixer; (14) meter; (15) stack (steam to atmosphere); (16) spout to elevator; (17) elevator; (18) screw conveyor to separator; (19) 14-ft. separator; (20) hydrate packer bin; (21) tailings screw conveyor (from 14-ft. separator to 8-ft. separator); (22) 8-ft. separator; (23) fines (8-ft. separator to elevator; (24) tailings to bin; (25) bin (tailings to waste); (26) 4-spout packer; (27) screw conveyor (packer spillage to elevator).



Left: The weighing feeder, which supplies quicklime at a uniform rate from the bin to the premixer.

Right: The 10-t.p.h. continuous hydrator, with the premixer at the right.

capacity, *viz*, a 50-ton capacity pulverized lime bin.

Under this bin is a belt packer to bag the lime in 80-lb. paper sacks, and alongside it is a 100-ton quicklime storage bin which feeds the hydrator. At the other end of the building is a 100-ton hydrate storage bin, under which is a 4-spout Bates packer for filling 50-lb. sacks. Ample working space is provided around all the machines and bins to allow for easy access to all working parts.

The building is of steel construction, with walls and roof covered with corrugated iron. Attached to this mill building is an 84- by 24- by 12-ft. warehouse for storage of empty bags and finished goods.

The manufacturing process is as follows: crushed or pulverized quicklime from the kilns is supplied to the two bins by an 18-in. belt conveyor and a split chute. The pulverized lime is spouted to the 50-ton bin and the crushed lime to the 100-ton hydrate plant storage bin. From the latter bin, the burned lime is fed at a uniform rate to the Knibbs premixer by a Schaffer poidometer, operated by a ¾-hp. motor and a Reeves variable-speed drive.

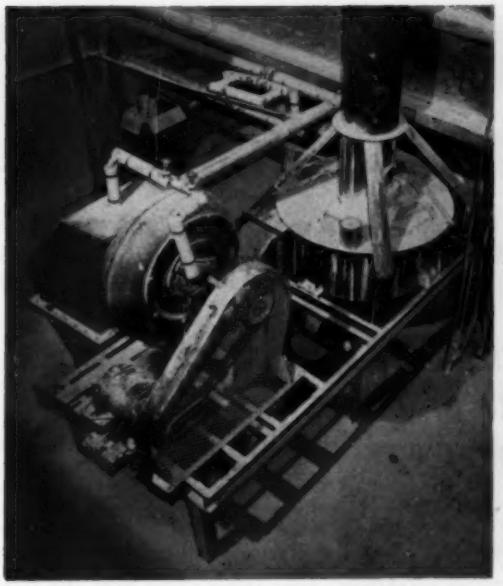
The premix continuously and intimately mixes the burned lime with a hot milk-of-lime solution, and the lime rapidly becomes uniformly wetted with an excess of hot water. This wetted lime is fed to the Knibbs main hydrator for complete hydration. The steam of hydration, with the finely suspended lime, is exhausted through a stack to the washer preheater fan. Through two jets, playing on the center of the fan, a supply of clean water, the quantity of which is controlled by a Foxboro meter, arrests the finely-suspended lime. This water is heated to the near boiling point by the steam of hydration. The hot milk-of-lime solution is collected in an air separator and continuously fed back to the premixer. Thus, a quantity of hot milk-of-lime solution equal to the amount of feed water supplied is formed and passes to the premixer.

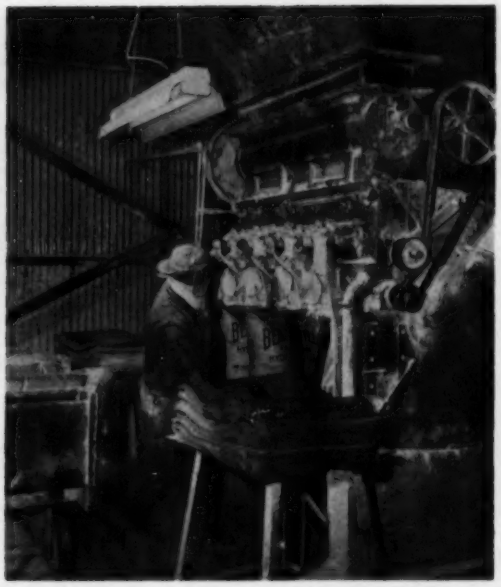
Excess steam is vented through a stack to the atmosphere. The hydrate is spilled over a weir arrangement high up on the discharge end of the hydrator and spouted to the boot of a bucket elevator.

The premixer is a box of rugged construction, approximately 6 ft. by 2½ ft. by 30 in. high. It is fitted with a forged steel shaft with replaceable rabble arms and supported on two anti-friction thrust bearings, being driven from the main shaft of the hydrator by silent chain and sprocket.

The Knibbs continuous hydrator has the same construction as the premixer but is larger, the rough dimensions being 12¾ ft. by 5½ ft. by 6½ ft. It is completely enclosed but has necessary access doors on the top for testing, and the bottom is fitted with clean-out doors. On the end there is a discharge valve for dumping unslaked loads. The specially-designed rabble arms are fitted to a hollow seamless steel shaft revolving on roller bearings in the heavy end

The elevator and screw conveyor from the hydrator, feeding to the top of the 14-ft. separator at the left.





Left: The washer preheater unit, with the cyclone separator at the right.
Right: The four-spout hydrate packer under the 100-ton storage bin.

frames of the hydrator, one bearing being designed to take end thrust. The drive is by a 20-hp. motor through a Hamilton gear reduction unit.

The washer preheater unit is a heavy industrial exhaust unit with a cast-iron case, driven by a 5-hp. motor and a variable-speed drive unit. The separator, duct work, and vent stack are of heavy gauge metal.

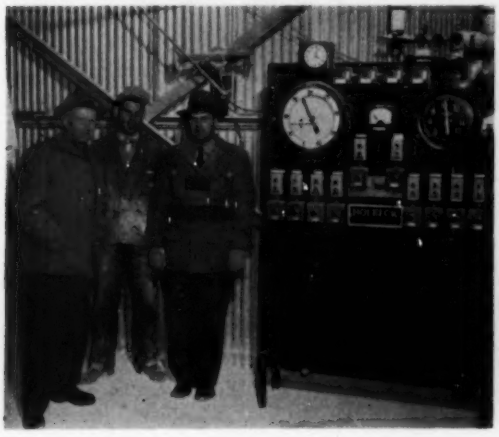
The hydrated lime from the hydrator is elevated and is then conveyed by the No. 1 screw conveyor to the 14-ft. Gayco separator set on top of the hydrate bin. The sides of this bin act as the outer cone, and the finished lime settles in this bin, which is over a 4-spout packer. The inner cone is attached to the No. 2 screw conveyor, in which the tailings are carried and fed to the 8-ft. Gayco separator. Here further separation takes place. The good material is returned to the elevator by spout and the tailings are deposited in a bin. From this bin the tailings are drawn off and disposed of in some suitable manner.

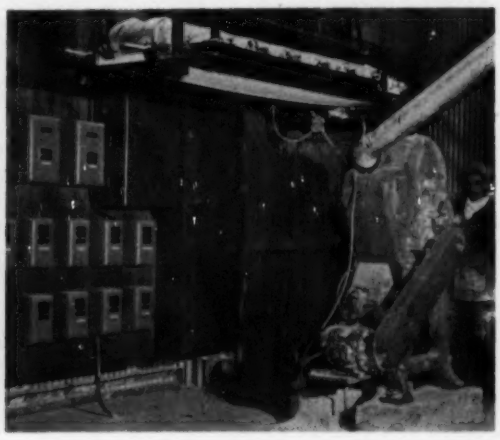
The controls for the whole system are on a panel board set beside the feed of the hydrator. The following instruments are mounted on the panel:

1. A Leeds and Northrup Micromax indicating recorder, complete with thermocouple for controlling the temperature of hydration.
2. A Foxboro Type 17 differential water flow meter, calibration 1,500 g.p.h., complete with mercury manifold, orifice flanges, and polished orifice plate. This is to control the feed water supply to the premixer.
3. Pushbutton starters for all the hydrating equipment and the visual interlocking control switches.
4. The bin eyes for all the storage bins.

(*Continued on page 116.*)

Before the panel board are R. S. Adams, plant manager, H. McGill, assistant plant manager, and L. Butterworth, kiln and hydrator superintendent.





The belt packer and the main switchboard.

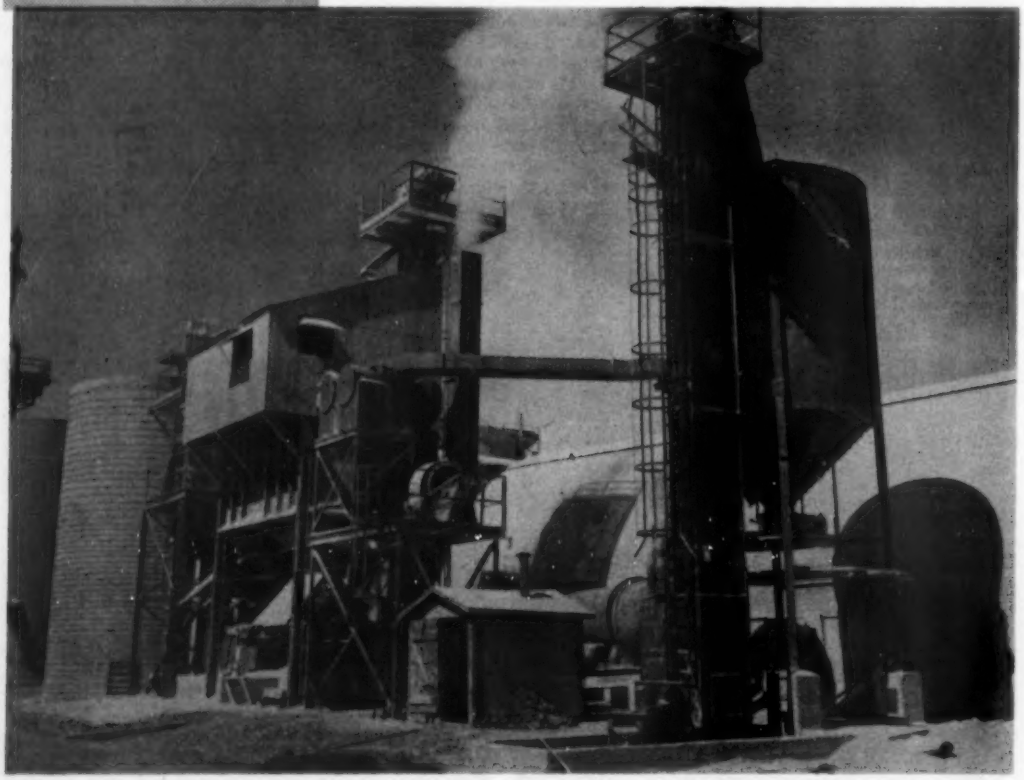
Ohio Firm's Unique Machine

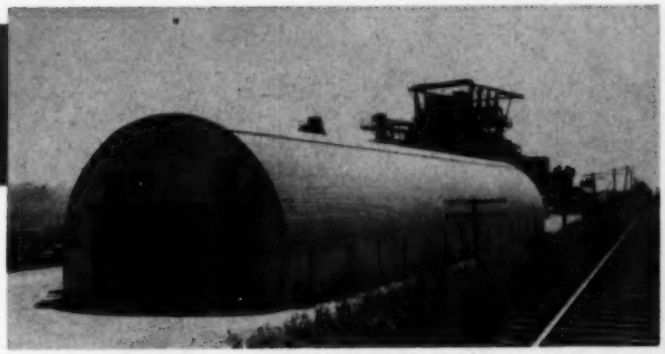
for RECLAIMING AND LOADING AGSTONE

Mobile rig loads trucks at rate of 2 tons per minute from covered storage area

By WILLIAM AVERY

General view of the Melvin Stone Company's modern agstone plant at Melvin, Ohio. Sized stone from the bins of an adjacent stone plant is fed to this circuit by means of the bucket elevator in the foreground.





The 40- by 200-ft. quonset type storage building which is one of the outstanding features of the plant. The steel work rests on 7-ft. high concrete block walls.

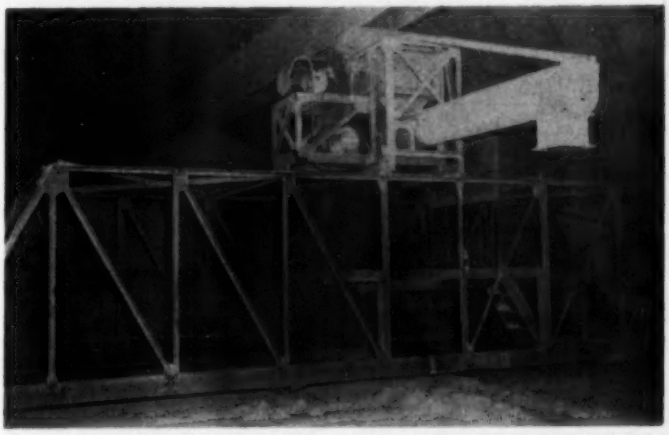
ON THE SPOT

THOSE of our readers who are engaged in, or who contemplate engaging in, the production of agricultural limestone will be interested in the following description of a relatively new plant located near Wilmington, Ohio. Built about two years ago to replace facilities which could no longer keep pace with demand, the plant has one outstanding feature—a unique and extremely effective mobile rig for reclaiming material and loading trucks. The plant is owned and operated by the Melvin Stone Company, and it was built at a total cost of approximately $150,000.

The loading rig operates on floor-level rails which extend the full length of a 40- by 200-ft. quonset-type storage building. It is power-driven throughout by means of five electric motors with a total of 27½ hp. As shown in the accompanying illustration, the main feature of the loader is a pair of conventional steel trusses which roll on wheels. It is powerdriven at speeds of from 2 to 20 f.p.m. through electric motors and transmissions.

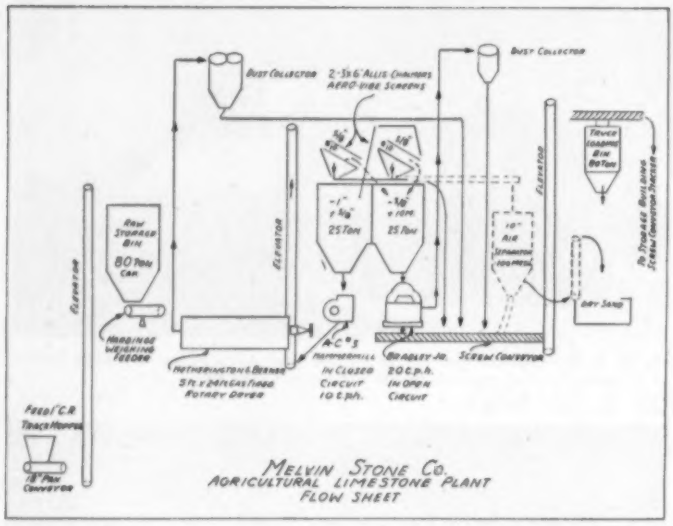
Ribbon screw conveyors are mounted just above the floor line on the leading edge of the machine, so that when the trusses are propelled forward, the screws come in contact with the base of the pile of stored material. The screws are right and left hand so that each delivers material to the center of the loader, where it is picked up by a bucket elevator. The latter delivers the flow to a short section of enclosed screw conveyor mounted above the trusses, and having a discharge point far enough behind the machine so that trucks of any size can be conveniently maneuvered.

Designed in its entirety by James O. Harris, production manager of the company, the loader reclaims agstone and places it in trucks at a rate of about two tons per minute. All motors are totally enclosed fan-cooled, gear-head units, and sealed anti-friction bearings are used throughout. Even during seasons of peak demand only one man is required for loading operations, and



Mobile loading rig developed by the company production manager, James O. Harris. Unit reclaims agstone from the storage building, discharging into trucks through the chute at the right. Fogginess of the picture is due to severe dust conditions which prevail whenever plant is in operation.

The 5- by 24-ft. gas-fired rotary dryer viewed from the firing end. This unit has lifters throughout its entire length.



of course, the entire operation is carried on under cover. Despite the extremely dusty conditions under which it must operate, the machine has required only minimum maintenance in the two years it has been in service, and there have been no serious breakdowns.

Wholly apart from the unique set-up for loading trucks, the storage building is an interesting and somewhat unusual structure. The quonset structure is supported on 7-ft.-high reinforced concrete masonry walls, so that at the center of the arch the building has a clear height of about 27 ft. Suspended from the highest point of the roof at a distance of 18 ft. 6 in. above the floor is a 12-in.-diameter screw conveyor in two sections, each 90 ft. long.

The height of the input screw conveyor is such that the material fed into the building reposes only against the concrete masonry walls—never against the quonset structure itself. The screw, of course, automatically distributes the material along the major access of the building, since the peak of the pile can not go higher than the screw housing. When the building is less than half full, it is necessary to operate only the first 90-ft. long section of the conveyor.

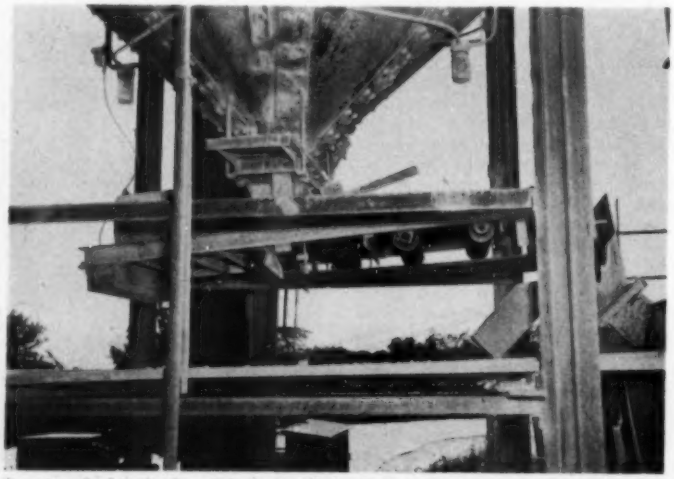
The storage system has a theoretical capacity of about 8,000 tons, this amount enabling the company to deliver large quantities of agricultural limestone when needed despite the fact that the average output of the plant is relatively small—around 30 t.p.h. Since all the material is dried in the processing circuit, the covered storage building serves the additional purpose of keeping the product dry until it is delivered to the farmer. The company feels that one of the most important advantages of covered storage is that, in combination with drying, it eliminates the practice of charging the customer for the 8 to 10 percent of water that would otherwise be contained in shipments.

Each fall the company shuts down the agstone production plant for a long enough period to exhaust the supply of stored material. This practice insures against the material setting up to a sufficient degree to cause trouble in loading operations. It also, of course, affords a fine opportunity for needed maintenance.

The Melvin firm's main business is the production of commercial crushed limestone, and there is a fine modern plant for this purpose adjacent to the agstone production unit. Primary and secondary crushing and screening are thus taken care of in the main stone plant, from which material sized to minus ¾ in. is drawn from bins as needed and hauled by truck to the agstone plant. The latter can also be fed from open storage piles, but this is done only on an emergency basis in order to hold the moisture content of the raw stone to the minimum.

The truck used for feeding the agstone plant discharges into a road-level hopper. Handling units between this hopper and the rotary dryer consist of an 18-in. pan conveyor, a bucket elevator, an 80-ton raw storage bin, and a Hardinge weighing feeder, these units being arranged in the order named. The dryer is a 5- by 24-ft. Hetherington & Berner gas-fired unit which is equipped with lifters throughout its length. It has a pitch of ½ in. to the ft. and is operated at a constant speed of 10 r.p.m. Two 4-in. burners are used and these operate on natural gas delivered at a pressure of 15 to 18 p.s.i.

The rate of feed to the dryer is varied in accordance with the moisture content of the stone by means of the Reeves variable-speed reducer through which the weighing feeder is driven. The stone is heated to between 300 and 325 deg. F. to drive out all moisture. In its natural state the porous stone from the Melvin deposit contains sufficient moisture



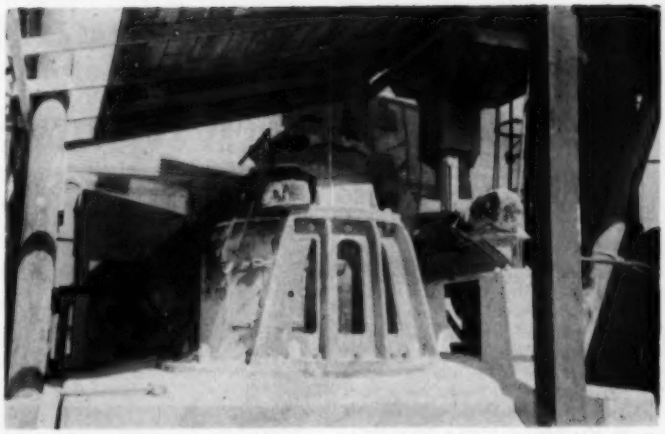
Raw stone feed to the dryer is both controlled and checked by means of this variable-speed weighing feeder.

to gum up the mills and thus seriously curtail production.

The dried stone is elevated and discharged over two 3- by 6-ft. Allis-Chalmers double-deck AeroVibe screens operating in parallel circuits. Both screens are equipped with ⅜-in. and 10-mesh cloth, and the arrangement is such that all plus ⅜-in. stone goes into one 25-ton surge bin, while all minus ⅜-in. plus 10-mesh material falls into an adjacent bin of the same capacity. Minus 10-mesh material from both screens goes directly into the finished-product handling system beyond the mills.

Two units are used in pulverizing the material—an American AC-3 hammermill which is fed from the coarse bin, and which operates in closed circuit with the screens; and a Bradley Junior mill which receives the finer fraction of stone and delivers finished material. The latter is a ring-roll type machine which incorporates an electrically-controlled table feeder. The hammermill is believed to account for approximately 10 t.p.h. of finished product, as compared with about 20 t.p.h. from the ring-roll unit.

In a screen test conducted by the State Department of Agriculture a random sample of the Melvin material showed the following: 99.8 percent passing 8-mesh; 81.75 percent passing 20-mesh; 56.1 percent passing 60-mesh; and 46.6 percent passing 100-mesh. This compares with state specification requirements of 100 percent passing No. 8 and 40 percent passing No. 100. On chemical analysis the same sample showed 21.1 percent minimum calcium and 12.5 percent minimum magnesium, with a total neutralizing power in terms of calcium-carbonate equivalent of 101.1 percent.



The ring-roll mill operates in open circuit on feed consisting of minus 3/8-in. plus 10-mesh material.

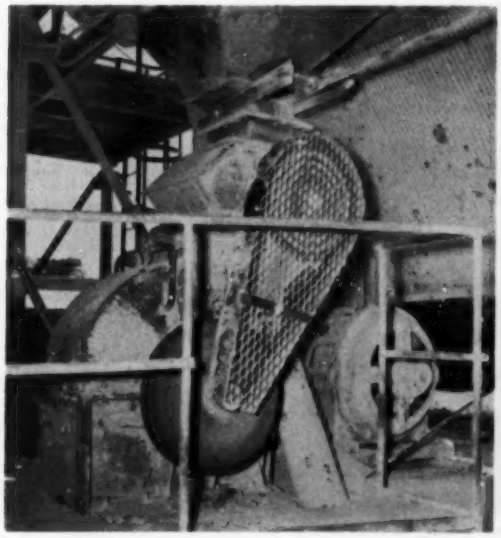
Finished material from the vibrating screens and from the Bradley mill drop into a screw conveyor. A bucket elevator refeeds the material to an overhead screw from which it either drops into an 80-ton truck-loading bin, or, when the bin is full, automatically enters the covered storage system already described.

The layout of the agstone plant includes facilities for the production of stone sand, but this feature of the plant has to date not been utilized on a regular basis. When the stone-sand system is in operation, a screw conveyor located under one of the screens feeds a portion of the flow of material to a 10-ft. Sturtevant air separator. By this means about 11 percent of total flow may be taken out as stone sand. There is a concrete stave silo adjacent to the agstone for storage of this material.

Other major facilities of the plant include two separate installations of cyclone dust collectors, one used for

(*Continued on page* 117.)

The hammermill which operates in closed circuit with the vibrating screens is fed plus ⅜ in. stone.



Closeup of one of the ribbon screw conveyors on the leading edge of the mechanical loader. Forced into the base of the pile of stored material, the screw feeds agstone to an elevator located in the center of the loader.

Rockwell Lime Company

Places New Rotary Kiln in Operation

By C. R. ATHERTON
Atherton & Evans
Consulting Engineers
Annville, Pa.

A general view of the Rockwell Lime Company plant near Manitowoc, Wis., showing the stone storage silos, the bulk-loading conveyor, and rotary kiln facilities. All screening is accomplished in the buildings above the silos.

SEVEN miles north of the industrial city of Manitowoc, Wis., the plant and quarry of the Rockwell Lime Company are located in the heart of the dairy farming district for which the state is famous.

The Racine Gulf formation, which outcrops frequently throughout the area, provides a high-quality dolomite for the company's operation. Many other plants, now mostly abandoned or idle, at one time operated in this general area. It is estimated that early in the century 150 kilns were in operation within a radius of 40 miles from Sheboygan. Only about 20 of these kilns are at present in operation. Low-capacity masonry kilns in various stages of disrepair dot the countryside. Manually-quarried stone, hand-fired with wood by immigrant labor, was the order of the day at the time of their construction 40 to 50 years ago. Rising labor costs, the scarcity and increasing cost of wood, attractions offered by nearby industry, and the nature of the work associated with primitive methods of lime production took their toll of plants operating on an increasingly narrow margin. Only those with a progressive outlook, special products, or other conditioning factors were able to survive.

When Michael Brisch assumed the management of the Manitowoc plant of Rockwell Lime Co. in 1946, he recognized the necessity for the mechanization of the quarry, the improvement of working conditions, and the development of the plant in conformity with acceptable modern practice. An undertaking of this magnitude necessarily required a considerable period of time and careful and extended planning in connection with each phase of operation.

The first step was taken in 1946, when the quarry was partially mechanized by the installation of a crushing plant to handle spalls from manually-prepared and selected kiln stone. The crushing plant consists of a 3- by 10-ft. Telsmith apron feeder, an 18- by 32-in. Telsmith jaw crusher, a 28-in. Telsmith intercone crusher, and a 3- by 8-ft. triple-deck Telsmith screen with interconnecting belts and a stone storage bin. The intercone crusher was placed adjacent to the storage bin and operated in closed circuit so that the larger sizes of stone could be recrushed and screened as required. Kiln stone and the product of the crushing plant were hoisted to the level of the tops of the kilns. A three-compartment Johnson bin was installed adjacent to the kilns and at the same height to provide for selective delivery of stone to trucks or to the agricultural limestone facilities, as might be required. Acquisition of a Hough Payloader took care of the problem of stone transportation in the quarry.

The second phase of the development eliminated wheelbarrow handling of lime from the kilns and greatly reduced the work involved in drawing. Two Lippman short transverse pan conveyors 18 in. wide were installed from the draw doors of the kilns to a 116-ft.-long pan conveyor

The plant before modernization, showing company houses in the background and quarry mule cars in the foreground.

Completes another step in its long-range improvement and expansion program

which fed the lime crusher. Start-stop pushbuttons controlling the long conveyor and the appropriate transverse conveyor were installed adjacent to the draw point, and the conveyor system was used to cool out the lime before crushing. Additional storage capacity was also provided. Drawing time was reduced by approximately 75 percent.

A short time later the kilns were placed under induced draft, as described in the August, 1950, issue of PIT AND QUARRY. In addition to improving fuel ratio and increasing kiln capacity, it was proved practical to burn 4- by 8-in. stone in the kilns. The purchase of a special toggle for the primary crusher and a change in the top screen in the quarry placed the production of kiln stone on a mechanical basis. Manual preparation and selection of kiln stone was abandoned, and the sledge hammer became a museum piece. Later the acquisition of a Bucyrus Erie gasoline shovel with a ¾-cu. yd. dipper and two Mack trucks simplified the operation further and reduced the amount of labor required in the quarry.

In the same year a new grinding building of steel construction was erected to replace the crowded and undesirable wood structure which had been in use for many years. Ample space for the installation of duplicate equipment or of hydrating machinery was provided in this new building. Up to this time the company produced no hydrate but was seriously contemplating the addition of this product to their line.

Also in the same year the Rockwell Lime Company purchased the plant, property, and goodwill of the immediately adjacent and historic Allwood Lime Company. The chief object of the purchase was the acquisition of increased limestone reserves. The plant proper, except for its hydrating facilities, was immediately taken out of production, the mules (sic!) sold, the tramway removed, and the equipment dismantled. Shortly thereafter the narrow wall of rock separating the quarries of the two companies was blasted down and access between the two provided. Long-term planning involves development of the property in such a way that the two quarries will ultimately become one and provide longer working faces. Relocation of the crusher is planned in order to exploit the increased holdings with the greatest possible economy.

In 1951 consideration was first given to the possibility of installing a rotary kiln. Samples of stone were tested at the basic industries laboratories of the Allis Chalmers Mfg. Co. to establish its suitability for rotary calcining and to determine the rate of attrition under calcining temperatures. The results of these tests proving favorable, it was decided to install a rotary kiln having a capacity of approximately 50 tons of lime per day.

The decision to install a rotary kiln justified the immediate installation of propane storage and vaporizing equipment and the conversion of the shaft kilns to propane firing. This conversion was described in PIT AND QUARRY for December, 1952. The elimination of wood firing simplified the burning operation to such an extent that one man could handle two kilns with ease, thus freeing one burner and the whole wood yard force for other assignments in connection with the expanding operation.

In the same year a Truscon prefabricated warehouse building was erected adjacent to the grinding building to provide storage space for bags, drums, and other supplies.

It is interesting to note that the company, in effecting this stage of development, decided to dispose of the company houses which were adjacent to the plant. These were sold to the employees at a nominal charge on the condition that they be removed from company property. All the houses were sold and have either been remodeled or rebuilt in the adjacent village of Rockwood. In every instance very considerable improvements were incorporated. In addition to eliminating all undesirable features associated with such housing, the change has been accompanied by an increased sense of community membership, pride of ownership, and many other psychological advantages which work in favor of both the company and its employees.

The feed end building. Note the method of recovering kiln stone from the silos.

The rotary kiln discharge end, with the wire-mesh belt conveyor to the storage bins. The processing building is in the left background.

As planning for the rotary kiln installation progressed, it became apparent that greater flexibility of stone preparation could be obtained if the secondary crushing and screening operations were moved from the quarry to the surface. The need for greater storage capacity for all types of stone other than kiln stone was also a matter of increasing importance. Complete modification of stone facilities was undertaken as the first step toward rotary kiln installation.

Stone Facilities Stone preparation in the quarry is now reduced to the operation of the primary crusher and two decks of the screen mentioned earlier. The top deck scalps off the stone for shaft kilns; the bottom deck removes contaminated fines when necessary. These fines are stockpiled in the quarry. Only two sizes are hoisted to the surface, plus 4-in. and minus 4-in. The former is charged to the shaft kilns and the latter to a recovery hopper formed by removing the partitions from the three-compartment bin mentioned above.

Under this bin a 20-in. by 5-ft. Telsmith plate feeder feeds minus 4-in. stone to a 3- by 6-ft. Simplicity screen which in turn delivers all plus 1½-in. stone to the Telsmith intercone crusher which was brought up from the quarry. Fines from the screen and the entire crusher product join on an 18-in. belt conveyor, pass to a bucket elevator, and are raised to the classifying screens and storage silos. Kiln stone is prepared on the primary screen at plus ⅜ minus ¾-in. and plus ½ minus ¾-in. and placed in two silos each 16 ft. in diameter by 60 ft. high. Fines from the primary screen are conveyed to a secondary screen with ⅛-in. screen cloth and separated into chips (plus ⅛ minus ⅜-in.) and agstone (minus ⅛-in.), in accordance with Wisconsin specifications. Three silos are provided, each 14 ft. in diameter by 50 ft. high. One of these is used for the storage of chips, the other two for agricultural limestone. All silos are of reinforced concrete slip-form construction and were erected by the Kasper Construction Co. on a contract basis. The screen houses above the silos were fabricated at the plant site.

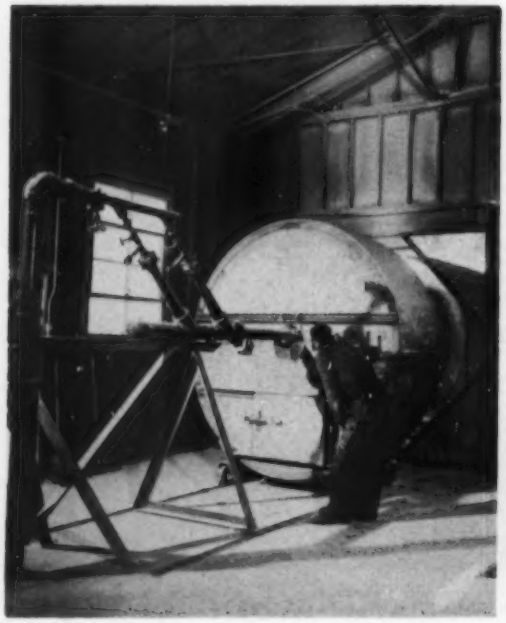
Kiln stone and chips in excess of plant requirements may be recovered by gravity directly to a Gilson hammermill for conversion to agricultural limestone. The building which originally housed this mill and storage facilities has since been torn down to provide additional turning and parking space adjacent to the silos. A Syntron feeder installed below a headbox at the junction of the gravity chutes provides for a controlled rate of feed to the hammermill. The product of the mill is conveyed to the stone elevator and joins the run of the secondary crusher at that point. It is probable that the near future will see this layout modified by the addition of another elevator which will provide for insertion of the hammermill product into the stone flow on the conveyor between the primary and secondary screens if it is to be stored and a conveyor for direct transportation to railroad loading when desirable.

Stone from all silos may be loaded by gravity to trucks, trailers, and spreading equipment. The company handles its own plant sales and bulk shipments of agstone; but spreading and "conveying" of limestone is delegated by contract to Paul Hessel, who operates from the plant office of the company. It is worthy of note that a considerable quantity of limestone of agricultural grade is used by the local farmers in sweetening the stalls and alleys of their barns. The desirability of having this material placed in the barn has led Mr. Hessel to install an ingenious conveyor on his spreading equipment which enables him to deliver stone inside the barn to a point designated by his customer through any convenient opening in the wall.

Finally, a system of conveyors at ground level provides for bulk loading of any type of stone to railroad cars and delivery of kiln stone to the bucket elevator which charges the kiln feed bin. The return conveyor

Below, left: The discharge end of the kiln, showing the gas inspirator arrangement.

Below, right: The interior of the building housing the rotary kiln drive.



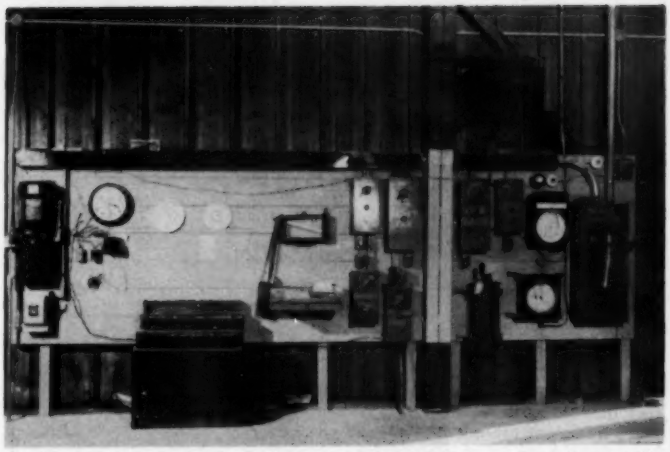
originally installed in connection with the intercone crusher in the quarry was used as the bulk-loading conveyor. All conveyors in this phase of the operation, seven in number, are completely standardized, and all parts, including drives, are interchangeable. The advantages from the standpoint of maintenance and reduced inventory are obvious.

Rotary Kiln Stone is withdrawn from the kiln feed bin by means of a Stephens-Adamson chop feeder and is delivered to the kiln through a stainless steel kiln feed pipe at a point below the feed end corbel.

The kiln proper is 6 ft. 4 in. in diameter by 150 ft. long; it is carried on three supports and is provided with drive and thrust rollers adjacent to the second riding ring. It was furnished by W. P. Heineken. It is of interest that, in designing a relatively small kiln, the 6-ft. 4-in. diameter was chosen because it could be rolled from a 20-ft. plate and fabricated with a single longitudinal weld. The discharge end of the kiln is provided with cast stainless steel nose blocks of simple design.

The lining is of Harbison Walker refractory brick. Beginning at the hot end of the kiln, it consists of 8 ft. of HW Special, including the discharge end corbel; 30 ft. of Slusite; 25 ft. of Boone; and 87 ft. of Duro, including the lining for a 20-ft. refractory tile section centered about the upper riding ring 30 ft. from the feed end. The refractory tile and buttress blocks are of HW Special. The hood, plenum chamber, and gas offtake are all refractory lined.

The cold end seal is of double diaphragm type and provides ample protection against draft loss. It was fabricated locally from drawings furnished by the engineers. The induced-draft fan is a Sturtevant No. 50 planing mill exhauster, 900 deg. construction. The temperature drop through the plenum chamber and gas offtake is such that 900 deg. F. provides an ample margin of safety insofar as operating temperature at the fan is concerned. A 30-hp. 1735-r.p.m. motor and V-belt drive operate the fan at 1260 r.p.m. Waste gas is exhausted through a stack at an elevation above the kiln feed building.



The kiln control panel, containing all devices connected with the operation of the rotary kiln.

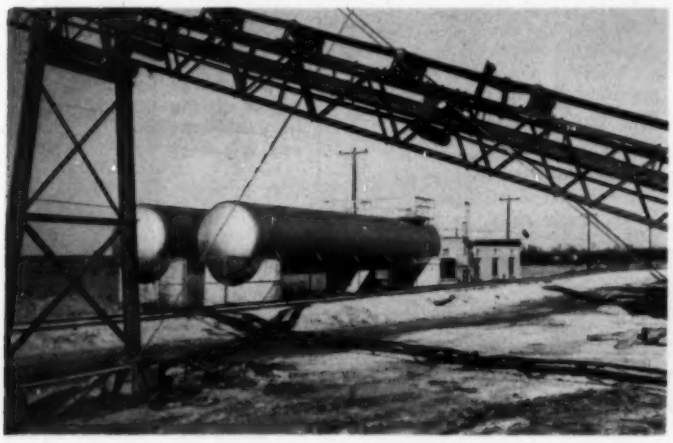
The kiln is driven at a normal operating speed of approximately 1 r.p.m. by means of a 25-hp. 1165-r.p.m. slip-ring motor, belt-connected with the high-speed shaft of a D. O. James reduction gear. Speeds of 0.7 to 1.1 r.p.m. are available for control purposes. Standby power is furnished by a Wisconsin heavy-duty V-type air-cooled 4-cylinder gasoline engine located so that a simple transfer of V-belts from the electric motor sheave to the standby motor sheave is possible. The kiln is driven at approximately ⅛ r.p.m. by the standby engine.

The feed end and drive buildings were fabricated at the plant site. The discharge end building is a 36- by 42-ft. Armco Steelox rigid frame structure erected on a reinforced concrete building wall in such a way as to provide an 8-ft. basement below the firing floor. The building and all other facilities are designed to provide for the future installation of a second kiln similar to that now in operation.

Gas for the kiln is metered through a Pittsburgh Equitable meter and is delivered to the firing floor at a pressure of approximately 23 p.s.i. An arrangement of two North American high-pressure inspirators in parallel provides for accurate control of the firing rate. At full capacity one of these inspirators operates wide open, and adjustments for the provision of extra fuel are made on the second inspirator. At subcapacity operation it is usually possible to use only one of the burners.

No cooler is provided in connection with the installation. Certain processes requiring the use of lime at elevated temperature are expected to take the major portion of the output of the kiln. Processing equipment for this phase of operation has not yet been installed; so for the time being, the kiln product is being handled hot, with a considerable loss in heat values. There may be some modification in the plans which will

(*Continued on page* 117.)



The propane storage tanks and the vaporizer house, viewed from beneath the bulk-loading conveyor.

NODULIZING

By N. V. S. KNIBBS, D.Sc., and E. G. S. THYER

IT HAS long been recognized that the most efficient method of heating or calcining solid materials is by passing hot gases through a bed of lumps of the material or by burning gaseous or solid fuels in the voids. To pass a sufficient volume of air or gas through the bed to attain a useful rate of heating without using too much power, it is necessary to have a high percentage of voids, which entails removing all the fine material from the broken solid.

The serious disadvantage that these fines cannot be used and the fact that many materials which require treatment are not available in lump form, have led to the development of alternative heating and calcining systems which are less efficient and have other disabilities. The problem of turning fine material back into lump form has therefore long been exercising the minds of men engaged in the processing of ores and minerals, and dusts and sludges.

The aggregation of finely-divided material into a solid by drying a wet mixture containing clay or some other colloid has been long used in the production of Portland cement, which, for many years, was made exclusively in shaft kilns; but it is seldom that mere drying results in the attainment of sufficient strength to permit mechanical handling, and the process of briquetting using pressure, with or without a binding agent, has long been used for aggregating a variety of materials.

Coal briquettes were said to be made first in France by Marsais in 1842. Pressures up to several tons per square inch are commonly used in modern briquette machines, which are of two types. The first consists of a pair of rolls, each with hemispherical or hemiovoid indentations, set so close together as to be almost touching. The prepared material is fed between the rolls and pressure is controlled by carefully regulating the rate of feed in proportion to the speed of the rolls; but complete control in this way is difficult, and some imperfect briquettes are generally made with this type of machine. The other type is a toggle press, which virtually presses out each briquette separately. Better and more uniform briquettes can be produced with this process, but the output is much lower.

The main disadvantages of briquetting are the high power requirements, the excessive wear and tear on the machinery, and generally the need to use a binder, which constitutes an adulterant or an impurity in the briquettes. The cost of the binder generally limits briquetting to materials having a relatively high value. A successful application is to coal dust, where the binder can be a material like pitch, which is a valuable addition to the fuel.

The natural tendency of fine materials to consolidate on drying, by virtue of their content of colloid, is enhanced by "working" the stiff mixture in a pug-mill, followed by extrusion as a continuous ribbon or rod which is cut into suitable lengths. Some materials can be extruded in so stiff a condition that these lengths of wet material can be handled as though they are solid and are therefore suited to drying and subsequent heat treatment in shaft furnaces. Extrusion is limited to plastic materials, and maintenance of the machinery is high. The water requirement is usually higher than with other processes, and for this reason extrusion is often the best process for dealing with wet sludges.

The process known as nodulizing depends upon the tendency of fine solids to aggregate into balls or nodules when moistened to the right degree and rolled in a cylinder. Under the correct conditions these nodules may have enough mechanical strength to be handled as though they were pieces of broken solid and, provided that they retain most of that strength when dry, they may be treated in shaft kilns.

Important advantages of nodulizing are the low power requirements, the reduced wear and tear on the machinery employed, and (with most materials) the fact that no binder is required. A surprising feature is the high mechanical strength that can often be obtained.

Nodulizing depends upon the natural adhesion of solids when contact is sufficiently close. In briquetting without a binder, the attainment of this close contact is attempted by the agency of extraneous pressure which, however, relies upon random particle distribution to provide enough area of contact between adjacent particles for adhesion to be effectively attained. If the size distribution and shape of the particles happens to be

(*Continued on page* 120.)

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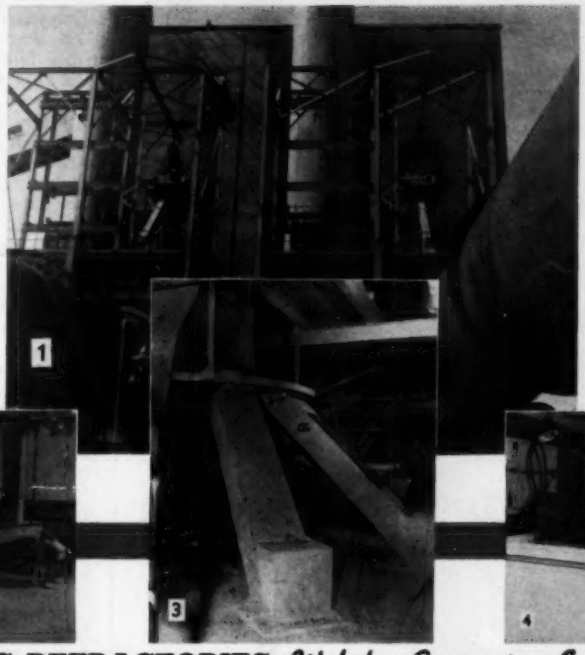

3 The handling of rough stone to various storage bins imposes abrasive action and operation problems that Webster equipment quickly solves.

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Potash Agstones

(*From page* 93.)

ducers and users should be followed to learn and establish without doubt where profitable, growing-plant response follows the application of potassium-containing rock dust.

To speed up this sort of fact finding, actual plant and soil tests might be run in laboratories and green houses.

Potash agstone will probably have to be pulverized to about 200-mesh.

It should be sold at a price which is based upon the nutrient elements which it contains. Calcium and magnesium may be figured in with the potassium. Indeed, in areas where soils are deficient in magnesium or calcium, basalt, or its coarse-grained equivalents, which are diabase and gabbro, may be worth as much or more for their Ca and Mg contents as for their potassium.

Research should be started to find out ways to make more quickly available the potassium which is combined in the rock.

Potassium is being pulled out of the soil by our food and fiber crops far faster than it is being replenished, and far faster than the high-grade, high potash industry in New Mexico is supplying it. It appears that eventually many local sources of potassium must be tapped, not only to supply volume or quantity of potassium, but also to hold down the high cost of transportation of heavy potassium material. It appears that we are entering upon a stage in our soil fertility-agricultural economy where the economics of potassium additives to soil invites the development of a potash agstone industry.

Gypsum, Lime, Alabastine

(*From page* 105.)

5. A KA 25 flush mounting ammeter, showing load on hydrator.

We have at the time of writing this article operated this plant for a month and are satisfied that it is performing as specified by the manufacturer. The designed capacity of 10 t.p.h. is maintained at all times; the quality of product is up to the standards set; the power requirement is low—rated load of less than 70 hp.; there is a minimum of machinery; good man-hour output is maintained; and it has given us a much cleaner plant.

The Standard Sulphur Company's new $450,000 sulphur plant in Damon Mound in Brazoria County, Tex., will be in operation soon, according to Gilbert Ebarb Sr., company president.

Reclaiming Agstone

(*From page* 109.)

venting the rotary dryer and the other for the Bradley mill. All recovered dust is fed into the finished-product handling circuit.

During peak seasons the Melvin agstone plant operates up to two full 9-hour shifts per day. Production on this basis runs somewhat in excess of 500 tons daily. On the day shift, when loading operations are in progress, three men are required, whereas on the second shift a two-man crew is sufficient to maintain full production. With the facilities described here the company last year produced somewhere between 60,000 and 65,000 tons of agstone, as compared with about 45,000 tons produced the first year the new plant was in operation. The company's ultimate goal is to turn out approximately 100,000 tons annually.

The Melvin concern is an offshoot of operations established on the same site in 1919 by C. C. Beam. The present name, Melvin Stone Co., was adopted in 1941, when the business was reorganized as a partnership involving C. C. Beam, Alice C. Beam and W. V. Custis. The first agricultural limestone plant was built in 1936. It included a rotary dryer and a single mill with a capacity of about 15 t.p.h., and the product was stored entirely in silos. In an average year the company ships around 350,000 tons of material other than agricultural limestone. Employment at the stone plant and at the sand and gravel plant totals around 55 men.

Rockwell Lime Co.

(*From page* 113.)

require the installation of a cooler in the future but up to the present this usually vital item of equipment has not been provided.

Lime discharged from the kiln is moved by a short pan conveyor to an elevator which raises it to a belt conveyor for transportation to storage. Because the lime is handled hot, this conveyor is equipped with a wire-mesh belt. It serves the dual purpose of conveying and cooling the lime before it is delivered to a series of three storage bins situated above the long pan conveyor which was originally installed in connection with the shaft kilns. One small bin is reserved for off-quality material, and the two larger ones are for the high-quality product. Lime from any of the three bins can be bulk-loaded to cars on the adjacent railroad track or introduced into the established flow of material for further processing.

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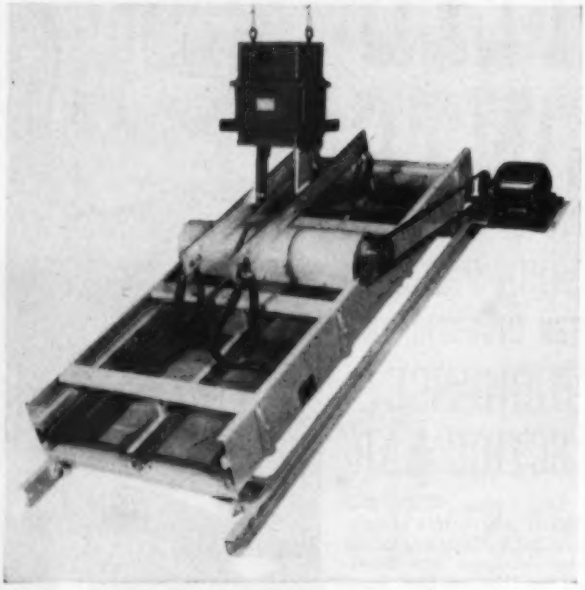

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- √ YOU CAN INSTALL A UNIVERSAL SCREEN, COMPLETE WITH UNILEC HEATING UNIT WITHIN FOUR HOURS — AT PRICES RANGING FROM $1375.00 UP.
- √ NO BLINDING OF THE MESH, SO YOUR PRODUCTION GOES UP AND YOUR CLOTH WEARS LONGER.
- √ NO "BURN-OUTS" CAUSED BY FAULTY INSULATION. YOU CAN SPEND FAR MORE TIME AND MONEY ON BURN-OUT REPLACEMENTS THAN FOR WORN CLOTH SECTIONS.
- √ NO NECESSITY TO USE COSTLY CLOTH SECTIONS.
- √ NO INSULATING STRIPS OR BUSHINGS REQUIRED.
- √ RUBBER-SHEATHED CONDUCTOR CABLES USED, IN SHORTER LENGTHS TO CONSERVE ELECTRICAL ENERGY, THUS REQUIRING A SMALLER TRANSFORMER.

Speed and simplicity in installing UNILEC units on Universal Screens makes it possible for you to install the machine first, adding heating later if desired, or in operating the Screen as a heated unit only when periodic conditions demand it.

WRITE TODAY FOR BULLETINS #140 ON UNILEC, #125 ON STANDARD UNIVERSAL HIGH-SPEED SCREENS

UNIVERSAL VIBRATING SCREEN CO.

RACINE — WISCONSIN

Controls Four control centers are provided for the operation of the equipment described. The first is located adjacent to the hammer mill and controls the recrushing circuit. The third controls the recovery circuit, including equipment for charging the kiln feed bin and for bulk loading. The fourth control center is on the kiln firing floor and includes all items directly associated with the operation of the rotary kiln. The temperature and draft instruments, starters with start-stop pushbuttons for the feeder, kiln, pan conveyor, elevator, metal belt conveyor, and induced-draft fan, and the drum controller for the kiln motor are mounted on a single panel adjacent to the discharge end of the kiln. Gas valves and gauges are mounted on the line between the meter and the kiln.

Further Processing Many of the processed products of the plant are highly specialized in nature and derive their special character from the varying physical properties of the stone from different strata of the quarry. Milk-of-magnesia lime for control of acidity in milk and as an additive in baby foods, horologic lime for polishing watch pivots and delicate instrument parts, ground lime of carefully controlled size for specialized industrial use, and a number of other products reach an international market. Hydrate, pebble, and lump lime are also produced for local consumption. The use of individualized packing methods, special containers, careful control devices, and accurate weighing all involve problems which differ somewhat from those encountered in most lime plants.

The hydrating and finishing equipment, operated until recently at the Allwood plant, has been transferred to the new grinding building to simplify and condense plant operation. The Allwood plant has been completely abandoned and the buildings are being razed.

Transportation Facilities The plant is served by the Chicago and Northwestern Railway. Two tracks, approximately 75 ft. apart, with the kiln and crushing facilities between them, provide for loading of stone products and unloading of gas on the north side of the plant and for loading of lime products to the south. Truck-loading facilities for all products are available, as well as means of loading for the service of local farmers, who are making direct purchases at the plant in increasing numbers.

Bulk truck shipments to the company's supply yards in Chicago are

made in a company-owned trailer truck known locally as the "Big Mo." On the north-bound run this truck carries brick from the Brisch Brick Company and such plant equipment as may be urgently needed. Providing full loads for both legs of the trip insures economically sound operation.

Future Plans The accomplishment of this phase of plant development does not complete the entire program. Future modifications to the plant now in the planning stage include (1) relocation of the crusher to provide for more economical exploitation of the larger quarry area; (2) installation of stone drying and pulverizing facilities; (3) an increase in hydrate production. It is anticipated that completion of these projects will require a number of years and that any other modifications which may be undertaken will be concerned with capacity increase rather than basic alteration of flow lines or production methods.

Labor The changing attitude of labor over the last 50 years was the subject of earlier comment. In this connection it is interesting to note that the combined labor forces of the Rockwell and Allwood plants totalled 39 men three years ago. Today 18 men are producing a considerably greater tonnage of both limestone and lime than was then produced by the two plants operating at capacity. The present labor force includes men who were employees at both plants. The normal process of attrition, combined with the fact that a number of long-time employees reached the retirement age at the same time about two years ago, has enabled management to reduce the number of men carried on the payroll without a large number of involuntary lay-offs.

As a result of decreased labor requirements, the company has been able to adapt its wage scale to that of the general area and to increase its power to hold capable men in spite of outside pressures. The net result has been a great improvement in owner-labor, labor-community, and owner-community relationships, a trend which has been of increasing benefit to all concerned.

Conclusion Each member of the working force of the plant has taken a personal interest in the developments just described. Outside contractors have been called in from time to time when the firm needed additional equipment, specialized help, or extra labor. To a large extent, however, the new plant is the product of management and labor working in harmony for the best interests of both. It is impossible to give personal credit to all concerned.

Michael Brisch, president of the company, was the mainstay of the operation and was personally responsible for the organization of the work and the supervision of progress. "Rusty" Brazzale, in his capacity as plant foreman, demonstrated time and again his interest in the development and his understanding of the problems involved. "Shorty" Connolly, who fabricated much of the steel at the site, and directed and assisted in its erection, proved himself a craftsman par-excellence. Ed Menchal, electrician, and Tom Slattery of the office force rendered valuable assistance in the project.

Atherton & Evans, Annville, Pa., acted as consulting engineers for the entire undertaking and furnished supervision at critical points in the program.

An expanded research program of the American Potash & Chemical Corp. is under way with the opening of a new $300,000 research laboratory in Whittier, Calif.

SLY PIONEERS & LEADERS in INDUSTRIAL DUST CONTROL

Ottawa Valley Crushed Stone Co. plant with Sly Dust Collector at right.

Agricultural Limestone "Dust" Pays For SLY Dust Collector

Your crushing operation can be cleaned up *with profit* as in the case of the Ottawa Valley Crushed Stone Co., Ltd. of Ottawa, Canada.

This company's problem was to control the dust created in screening the crushed limestone, conveyed from the crusher to the top of the screening building. This screening building, as shown in the illustration, is mounted on six silos of 300 tons capacity, each.

In this building there are three screens. The Sly Dust Collector is connected to a suction head of each and keeps the plant *free of dust.*

Although installed primarily to improve working conditions, the Sly Dust Collector has actually paid for itself through the dust collected —which is sold as agricultural limestone.

This is another instance of how Sly Dust Collectors pay for themselves besides providing better working conditions and keeping neighbors contented.

Why not write us about your situation and see what we can suggest? Ask for Bulletin 98.

THE W. W. SLY MANUFACTURING CO.

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New York • Chicago • Philadelphia • Syracuse • Detroit • Buffalo Cincinnati • St. Louis • Minneapolis • Birmingham • Los Angeles • Toronto

Nodulizing—

(*From page* 114.)

especially favorable, the strength is occasionally sufficient; but effective briquetting generally depends either upon the use of a binder or on the plasticity of at least part of the material, which then flows into the interstices under the applied pressure. Strength is obviously then limited by the limited adhesion and resistance to distortion of the plastic constituent.

In nodulizing, the particles roll together until chance brings some together into a more or less exact "fit", in which there is sufficient area of contact for firm adhesion. This process continues, so that the nodule grows, while at the same time the rolling action continuously results in pressure on a very limited area of each nodule, increasing the intimacy of contact, and therefore of adhesion and strength. Water is necessary both to lubricate the particles, so that they can slip into the most favorable position, and to replace adsorbed air, which tends to hold the particles apart, beyond the range of strong forces of adhesion. Nodules generally grow from a droplet of water, which starts the action, and as the nodule grows, part of the water may be squeezed out, so that it is available to moisten dry powder and assist its adhesion.

It follows from the mode of formation that particle size, shape, and grading largely decide the nodulizing properties of a material. Not only must there be a proportion of fine particles present, but the range of sizes must be suited to the formation of a dense nodule. Fine particles alone are not easily nodulized. Ores and minerals which have been finely pulverized by impact or in a ball mill generally contain a range of sizes that will produce nodules of good mechanical strength, but appropriate treatment may also make it possible to nodulize such unpromising materials as precipitated calcium carbonate, the crystal form of which is generally much too uniform to be suited to the process.

The water content, although it may vary considerably with different materials, is fairly critical. Too much water assists in the rapid formation of nodules but they are then much too soft and tend to run together or stick to the sides of the drum. If too little water is used, the nodules take much longer to form and tend to be hard and brittle. The optimum water content is easily recognized by observing conditions in the drum. It is much lower than that required by the extrusion process. The water content is so low, in fact, that if some freshly-made nodules are crushed, the material is still dry enough to retain its powder-like form.

Nodulizing is essentially a process of rolling, and the speed of the drum must be such that the nodules roll and cascade; but it must not be too high, or many nodules will be broken up again, after formation. Furthermore, the surface of the drum must be such that the nodules keep rolling and do not slide.

A large proportion of the time taken to produce a nodule is occupied in the formation of the nucleus on which a further agglomeration occurs, and anything which gives a measure of control over this part of the process represents a considerable improvement over methods at present in commercial use. Experiments have shown that a better start can be given to the nodules when the water is sprayed on to the dry powder in the drum than when it is mixed with the powder beforehand. The size of water droplets and the way they are sprayed on to the powder both have their effects.

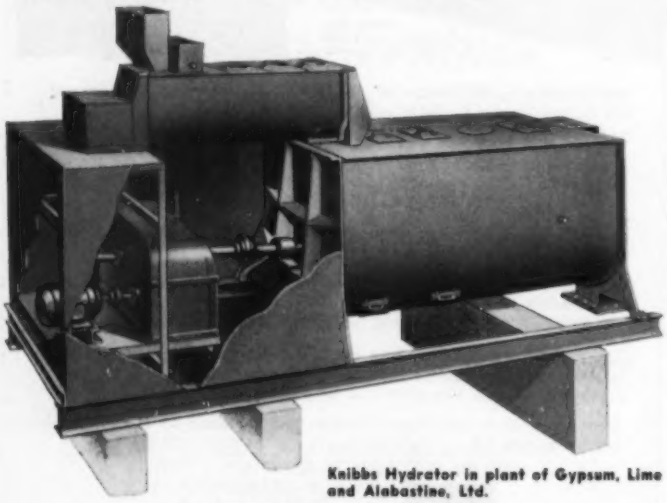
The simplest form of nodulizing plant consists of a drum of from 4 to

the KNIBBS
HYDRATING SYSTEMS
are used in the Lime industry because they fulfill the desired requirements.

6 IMPORTANT REQUIREMENTS

CAPACITY
QUALITY PRODUCT
OPERATING SIMPLICITY
LOW OPERATING COST
EASE OF CONTROL
COMPACTNESS, CLEANLINESS

On a recent installation the above specifications were required and fulfilled. The Knibbs method continually produces a pure, "sound" hydrate, with full lime recovery.



Knibbs Hydrator in plant of Gypsum, Lime and Alabastine, Ltd.

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HOLBECK CORPORATION, LTD.
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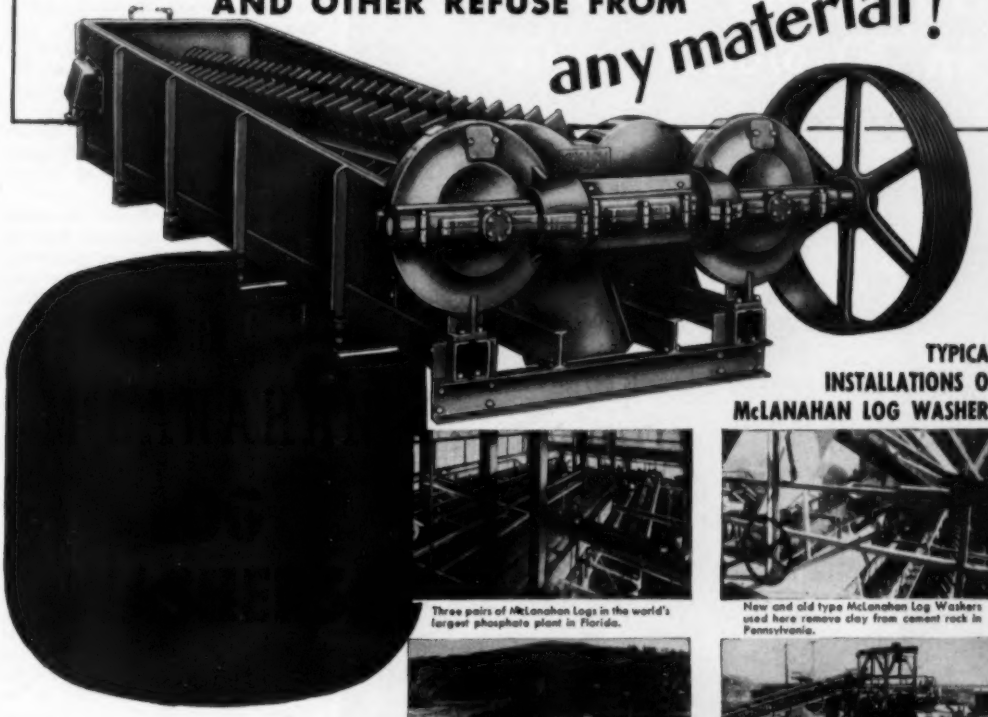
Remove TOUGH CLAY, SOFT ROCK AND OTHER REFUSE FROM any material!



TYPICAL INSTALLATIONS OF McLANAHAN LOG WASHERS

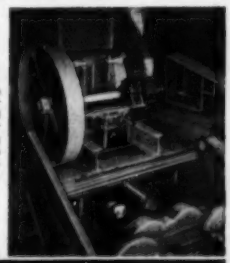
Three pairs of McLanahan Logs in the world's largest phosphate plant in Florida.

New and old type McLanahan Log Washers used here remove clay from cement rock in Pennsylvania.

McLanahan Log Washers removing tough clays from gold ores in Alaska.

McLanahan Paddle Mill and Log Washer cleaning Texas limestone.

Two pairs of 30' McLanahan Logs, used for cleaning sand and gravel in Virginia.



McLanahan Rockmaster Crusher and Log Washer removing tough clays from iron ore in Alabama.

McLanahan Welded Steel Log Washers are smooth running, highly efficient machines for removing tough clays, soft rock and other materials from iron and manganese ores, barytes, zinc, ochre, peat, limestone, trap rock, sand and gravel, phosphate, gold and other ores. These machines remove up to 90% of refuse materials—providing savings that more than pay for the installation in a short time. A few of hundreds of applications are illustrated at right.

Write today for Bulletin WLO 849

McLANAHAN & STONE CORPORATION
Pit, Mine and Quarry Equipment Headquarters
Hollidaysburg, Pennsylvania

Dependable Products: Single and Double Roll—and Jaw Crushers, Crushing Plants, Reciprocating Plate and Apron Feeders, Roll Grizzlies, Conveyors, Elevators, Screens, Scrubbers, Steel Log Washers, Sand Dregs, Hoists, Jigs, Dry Pans, Dryers, Scrap Bundlers, Pulleys, Gears, Bearings, Sprockets, Sheaves, Rollers, Bin Gates, Elevator Buckets, Gratings, Car Wheels, Ferrous and Bronze Castings.

Leading Agstone Producer Turns Out 717,909 Tons in 30 Months with . . . . .

AMERICAN HAMMERMILLS

Not a single major repair for these three American ACS-3 Hammermills at Columbia's Krause, Ill., plant . . . with average agstone production at 180 tons per hour.

The Columbia Quarry Company, a pioneer in the production of agricultural limestone, is producing today what is believed to be the world's largest single agstone output. In one year, they have shipped over 5% of the national tonnage. With this background of rock-crushing experience, Columbia has chosen to install American Hammermills in its three plants at Krause, Ill., Valmeyer, Ill., and Elsberry, Mo. At the Krause plant alone, three Americans have produced over 717,909 tons of agstone in the first 30-months—even though feeding on exceptionally hard Lower St. Louis Limestone.

Since their installation, *not one major repair* has been necessary on these Americans—in fact, no attention at all, except for the routine refacing of hammers and grate bars.

Nothing on the market today can equal these rock-hungry American ACS-3's for capacity, durability, or low cost of operation. Get all the extra-profit facts today. Write for free Bulletin "Better Stone Crushing".

American

Originators and Manufacturers of Ring Crushers and Pulverizers

1059 Mocklind
St. Louis 10, Mo.

8 ft. in diameter and from 10 to 20 ft. long, mounted horizontally or on a slight incline. The material can be fed into this drum either dry or previously mixed with the correct amount of water, no binder being required with most materials. The nodules form as the material builds up on itself to form balls, which become larger and larger as they proceed along the drum. Size can be partially controlled by the correct choice of drum diameter and speed and by varying the angle of inclination.

This type of nodulizer has been applied to many materials, but the results have often been somewhat disappointing and difficult to control. It has been found that the friction between the surface of the drum and the nodules has a large effect on performance. With many materials improved results were obtained when a layer of the material had built up on the surface of the drum. By fitting knives or scrapers, this layer could be kept to a uniform thickness, and the surface formed by the scrapers then gave the right amount of "lift" to the charge in the drum.

A disadvantage of the drum nodulizer is that nodules of all sizes are formed and discharged from the drum. It is therefore necessary to separate those of the required size by screening, crushing the oversize, and returning the crushed material with the undersized nodules to the drum. This involves handling a large circulating load, which reduces output and ups power consumption.

In a horizontal drum the largest particles revolve on the top or outside of the cascading mass and the smallest on the inside; but there is no segregation along the axis of the drum, and many of the newly formed minute nodules tend to move along and mix with the larger nodules, being crushed in the process. There is therefore no tendency to produce nodules of regular size. By using a conical drum, segregation can be made to take place along the drum, and nodules of different size then travel to, and concentrate in, different parts of the drum. In this way the nodules can be made to move along as they build up in size, so that by the time they reach the required dimensions they are in a position to discharge themselves from the drum. This method also assists in the initial formation of the nodules for which the optimum conditions are not necessarily the same as those required for building them up to the ultimate size. Segregation permits the possibil-

ity of having different conditions in different parts of the drum.

A similar result may be obtained by using a shallow pan instead of a drum, mounted so that its base is at an angle to the horizontal. In this way the formation of the nodules takes place on the base of the pan, the shallow side retaining the nodules until they are large enough to pass over it.

The systems outlined above, when used alone, have limitations, particularly when nodules with high mechanical strength are required. The nodules continue to grow until discharged; and in practice, with most material, it is difficult to get a nodule of high mechanical strength without the use of a binder. Rolling the full-sized nodule increases its strength, but in a continuous process the retention time in such a nodulizing pan is of necessity short. Nevertheless, excellent nodules can be made from many materials using this process; and it is in use at present with considerable success on the continent of Europe in the manufacture of cement in vertical shaft kilns.

It has been found possible to combine in one plant the features of automatic sizing and the hardening action attained by rolling the full-sized nodules. These "combined-action" nodulizers, now being actively developed, promise a considerable extension of the range of materials that can successfully be treated.

Nodulizing solves many long-standing problems, and as the process becomes more widely recognized, and further experience is gained, there is no doubt that a wide field of application will follow. Among the many possible applications the following are already in commercial use or are actively being developed.

1) Preparation of powdered iron ores for processing in blast furnaces, replacing sintering. This applies to naturally finely divided ores or to the fines made in crushing and handling lump ore, and also to ores which have been finely pulverized before undergoing some beneficiation.

2) Manufacture of portland cement in the much more efficient vertical shaft kiln, and also in rotary kilns, by an improved dry process where the powdered raw materials are nodulized before feeding them into the rotary kiln preheater, thus minimizing dust losses and insuring more even and efficient calcining conditions.

3) Heat treatment of ores which are too finely powdered to be processed by other means.

4) Utilization of dust collected from almost every calcining process carried out in rotary kilns.

5) Recalcination of many of the waste calcium carbonate sludges.

Greece's cement industry, which has doubled production in three years, is in position to export in addition to filling all domestic needs. Postwar cement output rose from 101,000 tons in 1946 to the 1952 figure of 596,000 tons. This is 100 percent more than the 1939 output.

SYNTRON

GASOLINE HAMMER ROCK DRILLS

Heavy Duty—Self Contained

Easily portable, this powerful unit saves time — cuts costs on many drilling jobs in the quarry.

Deliver over 2000 powerful blows per minute — with automatic drill bit rotation — with exhaust pressure to blow out holes down to 24" — no air compressor nor accessories needed. Portable, economical — cut job time. Write for complete catalog data.

SYNTRON COMPANY

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Here is the ANSWER to your MAGNETIC SEPARATOR JOBS!

HOMER "POWER-PLUS" MAGNETIC SEPARATORS

PERMANENT non-electric—Unaffected by HEAT, COLD or MOISTURE

CAN BE USED INSIDE OR OUTSIDE PLANT

HOMER PULLEY

HOMER MAGNETIC PULLEYS AND PULLEY UNITS—
Available in standard diameters from 12" to 30"; belt widths 4" to 60". Special sizes upon order.

HOMER MAGNETIC DRUMS—
Available in standard diameters from 12" to 30"; face widths 4" to 60". Can be furnished with or without enclosure.

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Available in standard widths from 4" to 26"; lengths and number of poles as required. Special fabrications to your specifications.

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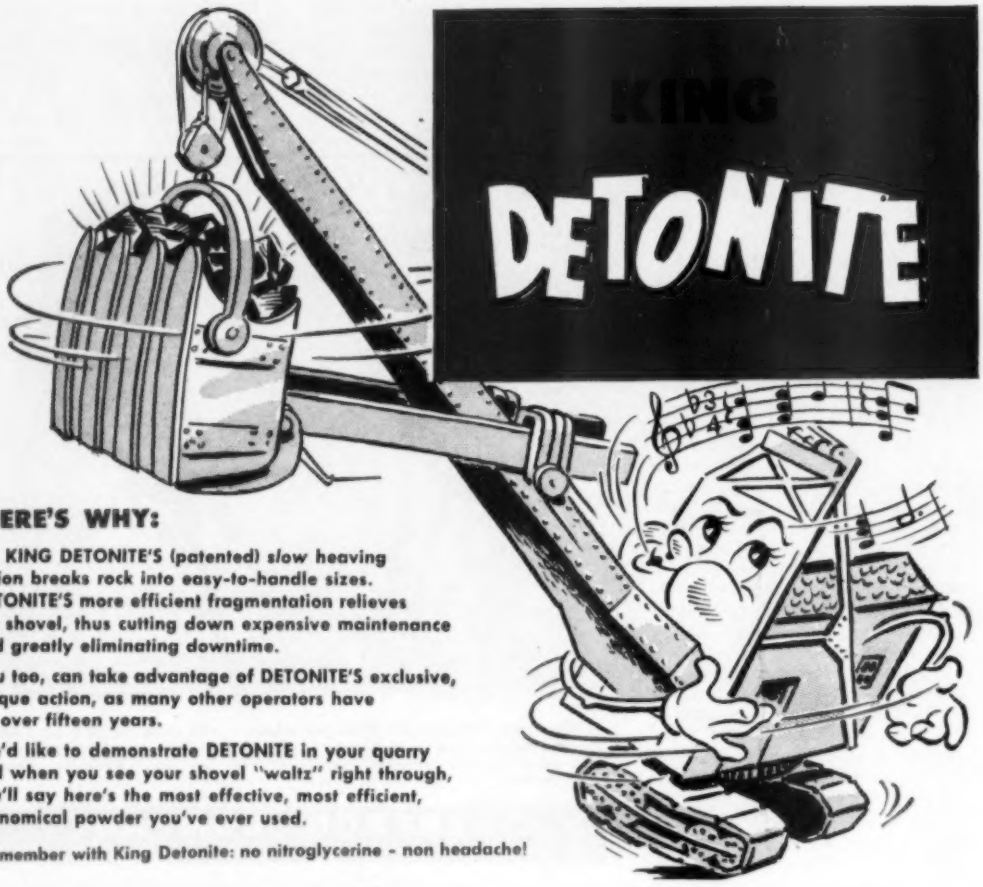
Write for descriptive bulletins

THE HOMER MANUFACTURING CO. INC., DEPT. I-52, LIMA, OHIO

shovels WALTZ when you use...



HERE'S WHY:

KING DETONITE'S (patented) *slow* heaving action breaks rock into easy-to-handle sizes. DETONITE'S more efficient fragmentation relieves the shovel, thus cutting down expensive maintenance and greatly eliminating downtime.

You too, can take advantage of DETONITE'S exclusive, unique action, as many other operators have for over fifteen years.

We'd like to demonstrate DETONITE in your quarry and when you see your shovel "waltz" right through, you'll say here's the most effective, most efficient, economical powder you've ever used.

Remember with King Detonite: no nitroglycerine - non headache!

4 WAYS TO CUT COSTS

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SHOW ME how DETONITE will cut my costs 4 ways. Without obligation, have the King Representative get in touch with me to arrange for a DETONITE demonstration right at our quarry.

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PATENTED SURFACE-SENSITIZED EXPLOSIVE

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THE KING POWDER CO., INC.

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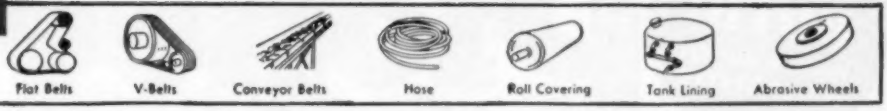
MORE SHOCK-LOAD CUSHIONING . . . The extra body-cushion built into Homocord Conveyor Belt dissipates even the shock of sharp impact from large lumps of coal, rock and ore . . . A Homocord Conveyor Belt resists gouging and cutting. It lasts longer . . . and hauls more too—because it troughs naturally and trains easily in the idlers. That's MORE USE PER DOLLAR. Another R/M Conveyor Belt, Ray-Man "F", is designed particularly for underground mining where pulleys are small and great flexibility and tear resistance are needed. Both of these R/M belts give you long life on the job, MORE USE PER DOLLAR. Ask the R/M distributor for Bulletins 6906 and 6915. R/M field engineers back him up to save you money—not only in conveyor belts, but in hose, transmission and V-belts.

R/M

MANHATTAN RUBBER DIVISION – PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
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When the heat is on...

that Pioneer Edge

Pioneer crushers, conveyors feed Southwest's biggest rotary lime kiln

Here, just south of Cleburne, Texas, is one of the world's most remarkable lime-producing plants. With its unique system of preheating and a huge 130 foot rotary kiln, Limestone Products Company is turning out excellent quality lime at surprisingly low cost.

It was natural that the designers of this big, modern plant should choose PIONEER equipment for the important job of keeping it supplied.

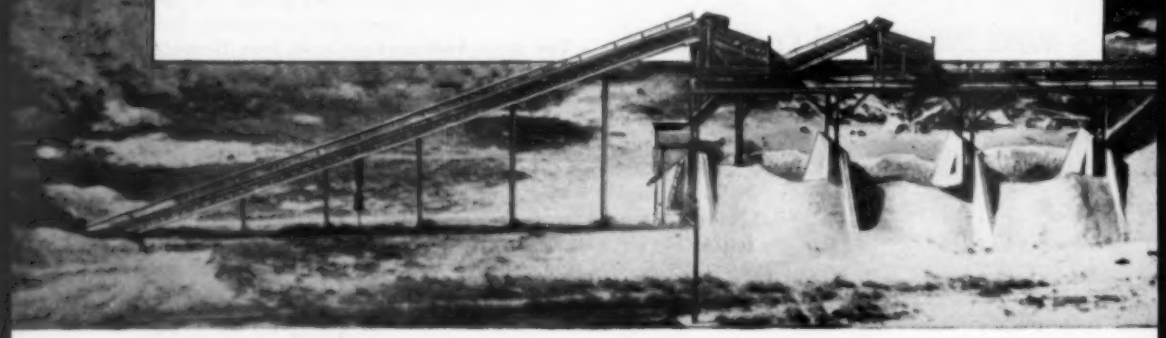
Beginning in the quarry, a 12′ PIONEER traveling grizzly receives the rock, feeds it evenly to a 24″x36″ PIONEER jaw crusher which, with 75% crushing, has a capacity of 100 t.p.h.

An inclined conveyor and an overhead shuttle conveyor then stockpile the product. Later, an 18″ belt conveyor reclaims it from a 125′ tunnel and discharges it into waiting trucks for haulage to the lime plant. All three conveyors were made by PIONEER.

At the plant, stone is quickly reduced to minus 1½″ by a 30″x18″ PIONEER roll crusher (located under the unloading ramp shown at the left of the photo), then elevated by an inclined PIONEER belt conveyor to a double-deck PIONEER vibrating screen. Another short PIONEER inclined elevator whisks stone to a second PIONEER screen which drops material into open storage piles below.

Stone is reclaimed from these piles through bin gates in the roof of a long underground tunnel, conveyed to a bin above the preheater for burning . . . or to the pulverizing plant for conversion to agricultural limestone, cattle feed, and roofing and asphalt filler.

Once again, superior design and rugged construction have enabled PIONEER to deliver the goods . . . efficiently, economically, reliably . . . another instance where the PIONEER EDGE has lowered operating costs while helping an experienced operator produce a superior product.



BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

delivers lime on time

Source of limestone is this quarry, located 16 miles from the Cleburne lime plant. Here the stone is crushed, stockpiled, reclaimed, then loaded into trucks at the tunnel mouth shown at left.

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota
(SUBSIDIARY OF POOR & COMPANY • CHICAGO)

• Please send information on the equipment checked.

☐ GRAVEL PLANTS	☐ BITUMINOUS PLANTS
☐ ROCK PLANTS	☐ APRON FEEDERS
☐ JAW CRUSHERS	☐ MECHANICAL FEEDERS
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☐ ORD FEEDERS	☐ CONTINUFLO CONVEYORS

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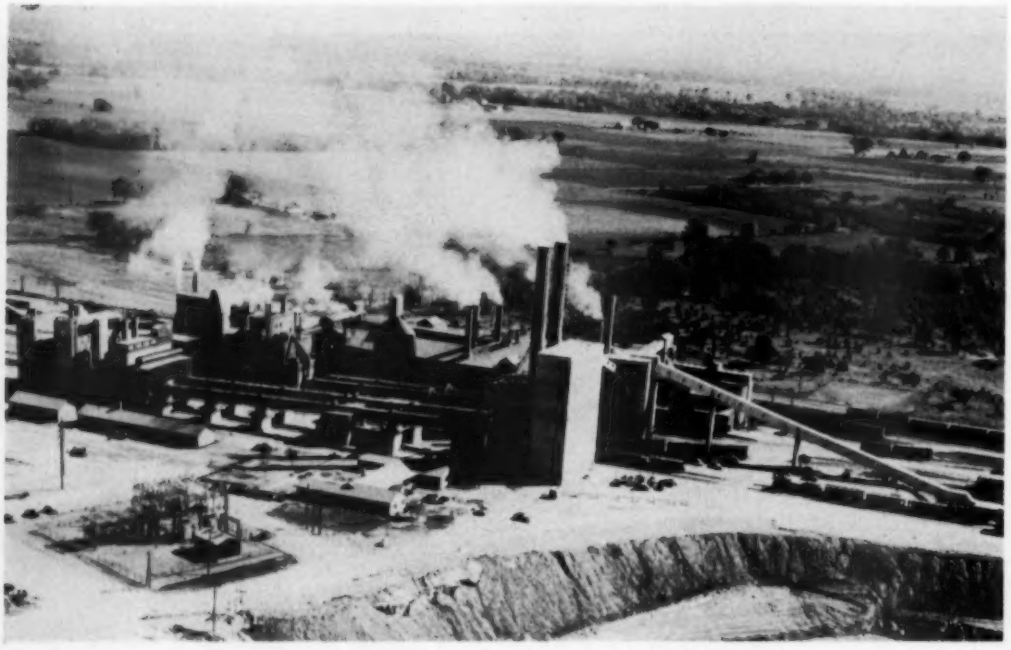
IN BEAUTIFUL OHIO



At Maple Grove, this modern plant of Basic Refractories, Inc., includes the two largest rotary kilns used in the Refractory dolomite industry. These kilns are 11 ft. 3 in. x 390 ft. in size, and increase the plant's annual capacity by over 300,000 tons. This is another satisfied owner added to the many companies using engineering and construction services supplied by the Macdonald Engineering Co.

For the design and construction of your new plant or plant additions, contact us at any of our offices.

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Construction Engineers

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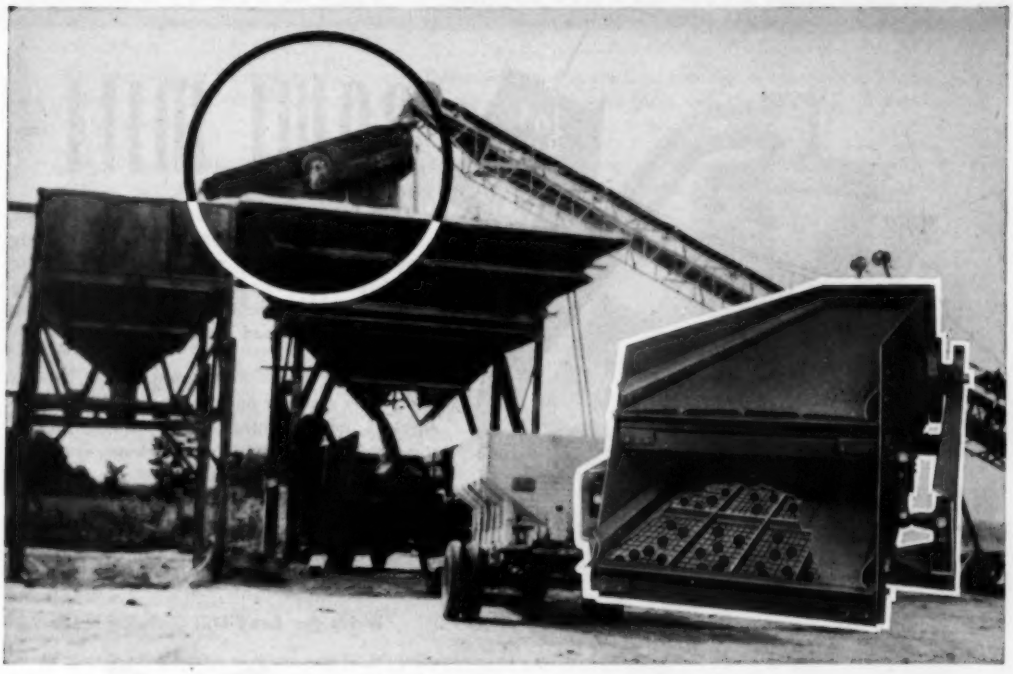
AG-LIME GETS THROUGH HERE



THE SHARP, POSITIVE WHIP OF A SECO PAYS OFF ON THIS DIFFICULT JOB.

It is a matter of record on numerous ag-lime installations that the sharp, positive whip of a Seco vibrating screen has proven itself master of the situation. (The Seco pictured above the bin in the illustration has been doing this for eight years.)

The sharp, positive whip of Seco vibrating screens doesn't just happen. *They're engineered that way.* You see, only Seco has the patented equalizer assembly and this basic engineering difference makes the big difference in performance.

With a Seco there's a minimum of blinding, the screen doesn't flatten out or lose its wallop. It's "alive" over every inch of screening area . . . for accurate screening . . . for good capacities.

BALL TRAY ATTACHMENT NOW AVAILABLE.

For extra moist Ag-Lime, a Seco with ball tray attachment placed on the underside of the deck or decks will prove unusually efficient. Get the whole Seco story today! Send for literature.

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

REMEMBER! ONLY SECO HAS FULLY CONTROLLED TRUE CIRCULAR ACTION.

This is the big reason why Seco is so efficient at screening ag-lime. There's no bobbing, no weaving, the sharp, *controlled action* keeps the load moving *evenly.* Consult your nearest Seco dealer now or write for his name.

SCREEN EQUIPMENT CO., INC.
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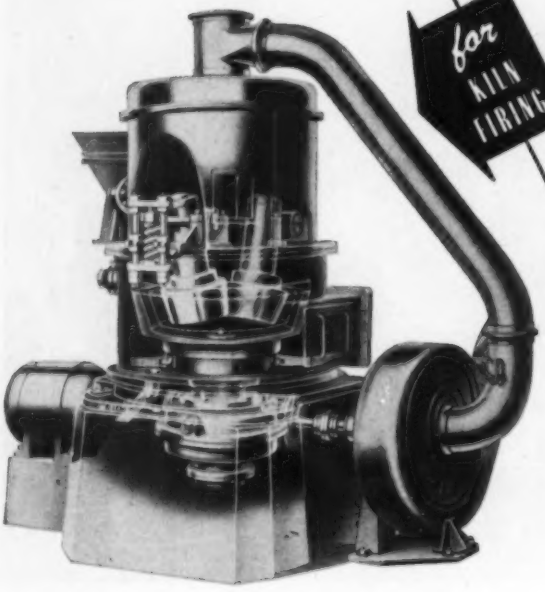
For Lower Costs Specify **RAYMOND EQUIPMENT** for



for KILN FIRING

BOWL MILL

THE Raymond Bowl Mill provides a complete and fully coordinated system of coal grinding and direct firing for rotary kilns. It helps to maintain maximum kiln efficiency by providing flexible firing control and instant response to meet changing load conditions.

This modern direct firing unit readily handles coal of any grade or moisture content. It is easily adjusted or lubricated while running and is sturdily built for continuous 24-hour operation. All controls are centralized on a panel board which simplifies the supervision of one or several mills.

Well over two thousand installations have proved the superiority of the Bowl Mill in dependability and economy of operation and maintenance.

Write for Bowl Mill Catalog #62

MECHANICAL AIR SEPARATOR

WITH DOUBLE WHIZZER

This modern centrifugal separator is well adapted to classifying hydrated lime and limestone.

The Whizzer feature and fineness control provide significant advantages whether the job requires separation to produce a high fineness material, or in the case of a dedusting operation to remove objectionable fines, as required for bituminous concrete.

It is also highly efficient in closed circuit grinding operations in combination with a pulverizing unit.

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for CLASSIFYING LIME PRODUCTS

COMBUSTION

Raymond

SINCE 1887 — PULVERIZER DIVISION

LIMESTONE AND LIME PRODUCTS

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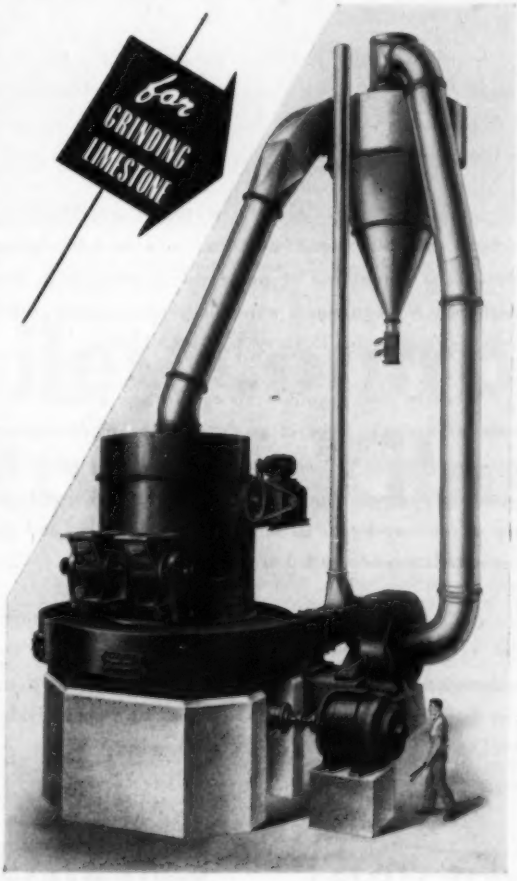
The Raymond line includes specialized units for direct-firing pulverized coal to rotary kilns, drying and grinding limestone, disintegrating and classifying hydrated lime . . . all with automatic, dustless operation.

SUPER ROLLER MILL

Raymond Roller Mills have long been standard equipment in the limestone grinding field . . . and today with the trend toward huge production plants, there is demand for Super Roller Mills which provide capacities of 15, 20 and 30 tons or more per hour of finished material.

These big machines offer economical advantages in conserving space, centralizing operations, simplifying material handling, also savings in installation, maintenance and supervision costs compared to a multiple mill installation of equivalent output.



●

In a recent application, a Raymond Super Roller Mill has been installed, as part of a new plant expansion program to supplement the present smaller units, thus greatly increasing daily production. This giant mill is equipped with Flash Drying accessories for handling Virginia limestone containing several per cent initial moisture. As it dries and grinds in one simultaneous process, the Super Roller Mill shows an outstanding record of low cost production of quality grades of limestone.

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For handling hydrated lime, the well-known Raymond Automatic Pulverizer with Whizzer Separation is widely used as the standard machine in the industry. It disintegrates and classifies the lime, and automatically rejects impurities, delivering a uniformly fine, high purity finished material.

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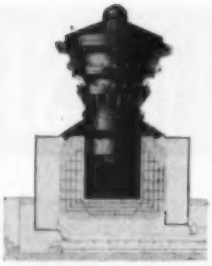
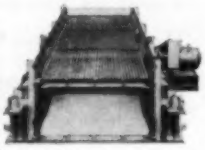
Whether your requirements call for the addition or replacement of a single piece of equipment, the modernization of an existing layout or the building of a complete plant for the manufacture of cement, lime or mining operations, Kennedy engineers are at your service to assist in planning, creating and specifying the installation best suited to your needs.

KVS engineers are available for consultation anywhere in the world. We invite your inquiries regarding our machinery and equipment . . . literature is available upon request . . . to help you determine the BEST method of solving your individual problems. Get the KVS story *before* you specify!



Gyratory Crusher, primary and secondary types, with double discharge outlets.

Swing Jaw Crushers: Heavy duty models, reversible jaws.



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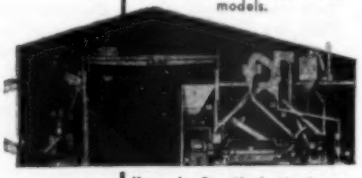

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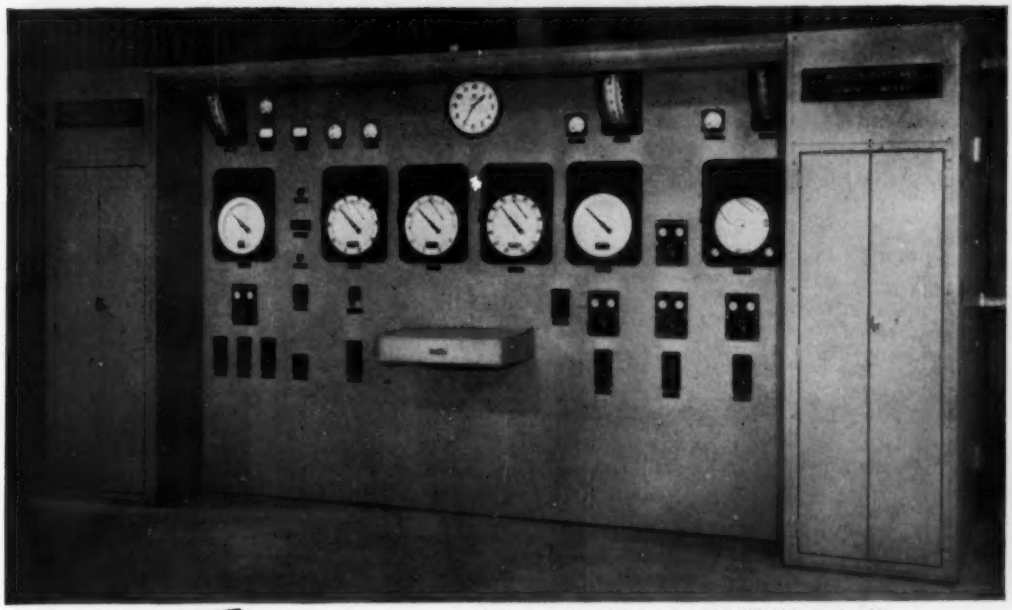

Main Panel Board for control of 3000 bbl per day Kiln at Missouri Portland Cement Company, St. Louis, Missouri.

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2. Uniform Quality of Product
3. Reduced Maintenance

These are advantages which can be achieved when all phases of kiln operation are coordinated to work together as a team. Here's how Bailey Kiln Control can help you get all three.

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With Bailey Combustion Control you can be certain that you are getting maximum product for every unit of fuel you burn. Bailey Control closely guards the Fuel-Air Ratio, Hood Draft, Fuel Feed, Clinker Cooling and the Temperature of Air for Combustion.

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Bailey Instruments and Controls can help you achieve a uniform high grade product. Measurements of temperatures, kiln speed, combustibles content, and oxygen content can be transmitted to recorders on centrally located control boards like the one shown. There is no sacrifice of accuracy or speed of response. High temperature alarm contacts may also be provided with Bailey Pyrometers as a further aid in achieving optimum uniformity of product.

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DENSITY
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GM DIESEL
CASE HISTORY No. 528-84

USER: B.L. Anderson, Cedar Rapids, Iowa.

INSTALLATION: 21 GM Diesels (3, 4, and 6-71's and "Twin" 6-71's) powering shovels, Koehring Dumptors and three portable rock crushers. Firm produces 4,000 to 5,000 tons of road stone per day.

PERFORMANCE: Supt. L.V. Porter reports GM Diesels have reduced fuel and maintenance costs considerably. Overhauls cost less and are needed less frequently. Crushers can run 7" material without stalling engines. Lighter weight of engines has made equipment easier to move.

GM DIESEL POWER

CUT CRUSHING COSTS with GM DIESEL POWER

When this company replaced the gasoline engine in a shovel with a General Motors Diesel in 1945, fuel costs dropped 50%. That was B. L. Anderson's first GM Diesel. Now they own 21 units, because they found these engines reduce operating expenses.

The GM Diesel boosts production in all kinds of heavy-duty jobs because smooth 2-cycle operation makes it accelerate faster under load changes. It starts quickly in any weather and operates on a miserly quantity of low-cost fuel. It delivers dependable, economical power for thousands of hours without requiring major repairs.

And when service is needed, you'll find the cost surprisingly low. Compare parts costs with other Diesels, for example, and you'll quickly see what we mean. That's one of the many good reasons why contractors in every field are switching to GM Diesel power.

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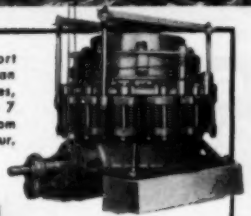
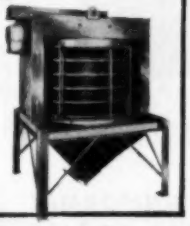


The *SYMONS* Short Head Cone Crusher can be furnished in 4 sizes, ranging from 3 ft. to 7 ft., with capacities from 15 to 300 tons per hour.

The *SYMONS* Impact Crusher comes in 4 sizes, ranging from 26 in. to 46 in., with capacities from 25 to 225 tons per hour.



The *SYMONS* "V" Screen employs controlled diffused feed and vertical flow of material, that assures a sharp wet or dry separation of difficult sizes from 4 mesh to the very fine meshes.

. . . and for greater tonnages of finer "Ag-Lime" use

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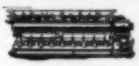
GRINDING MILLS

SYMONS VIBRATING BAR GRIZZLIES

SYMONS ROD DECK SCREENS



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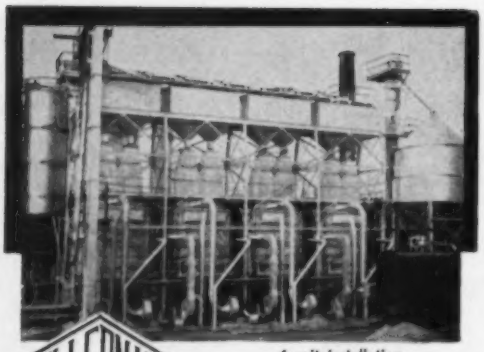

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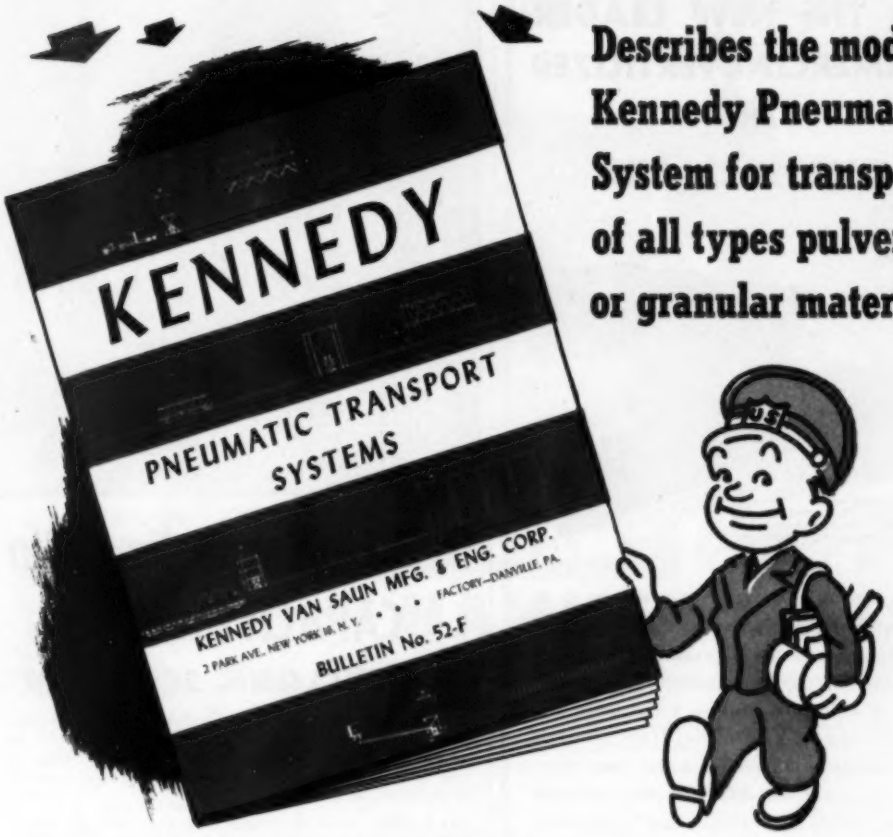
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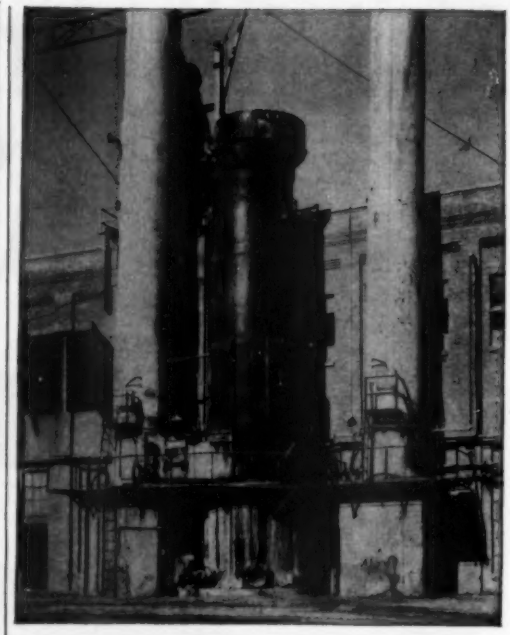

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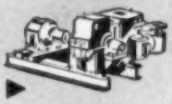

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Should Public Funds Continue to Be Used To Promote the Use of Agricultural Limestone?

By ROBERT M. KOCH
Executive Secretary
National Agricultural Limestone Institute, Inc.

another P.Q. exclusive

IN recent weeks everyone in the agricultural limestone industry has become increasingly aware of the growing conflict over appropriations for a continuation of the Agricultural Conservation Program. This is the program which has provided incentive payments for farmers who have used agricultural liming material.

The present appropriations conflict is intensified because for the first time since this type of program was inaugurated in 1936, the Administration, instead of Congressional critics, is asking for a substantial reduction. The immediate problem is rather easy to state, Secretary of Agriculture Ezra Taft Benson wrote in the April issue of the *Farm Journal*, "I am for sound agricultural conservation with all my heart. But I never believed you ought to pay people to do what they profitably should do and could do themselves." Consequently, we have the administration asking for $140,000,000 for the Agricultural Conservation Program for 1954, with very little of it to be spent for agricultural limestone. Several Congressional leaders will try to continue the Program at its present level of $250,000,000. The House of Representatives will consider the U.S.D.A. appropriation bill about the middle of May, and the Senate action will follow in June. The chart in Figure 1 shows the history of the appropriations made under the Soil Conservation and Domestic Allotment Act, which authorizes the present program.

Senator Wayne Morse, speaking at the recent N.A.L.I. Convention, summed up another view when he said, "I happen to be one who believes that direct payments out of the Treasury of the United States to the farmers for the development of sound scientific soil-conservation practices has constituted a wise expenditure of defense dollars. I respect the sincerity of viewpoint of those who believe that the farmers themselves should protect and conserve, without assistance from the government, the topsoil of their farms. I appreciate the fact that it is plausible to argue that a thrifty and wise farm owner can be counted upon to protect his own topsoil. However, such an assumption, reasonable though it would seem to be, cannot be squared with experience. The contention that simply because the present titleholder of a farm has enough money to pay to carry on a soil-conservation program, *ipso facto* he will carry it on, is not in accord with the facts. The records show that farm owners have not done that to the degree that is necessary if we are to protect and conserve our topsoil national asset. An examination of the records of the soil conservation program of the United States Department of Agriculture shows that bad soil practices are not limited to so-called marginal and sub-marginal farms, but also to many of the large prosperous farm operators.

"Furthermore, there is a principle of truth in the statement that although an individual farmer may have legal title to a farm, and under our precious system of private property in the United States upon which so much of our individual freedom depends, is free to do just about anything he wants to with his land, nevertheless, in a larger sense he also holds that farm in sacred trust for future generations of Americans. All of us as citizens of the United States have an interest in the nature of that trust and in the soil practices the farmer maintains in fulfilling that trust."

A fact frequently overlooked is that we in this country, where we have the highest standard of living in the world, are depleting our soil at a faster rate than any other nation in history. We all know that one of the reasons why the millions in India and China are such easy prey for Communism is that they are always hungry. The great farmlands of India and China were dissipated through centuries. We in this country are maintaining our high standard of living by depleting our greatest natural resource—the soil—at a much faster rate than either India or China ever did.

Much of our soil has only been broken by the plow in the lifetime of many who read this article. We developed this country by farming our soils until they ran out, and then we moved west. We can no longer move west. True, we have made great strides in soil technology, seed

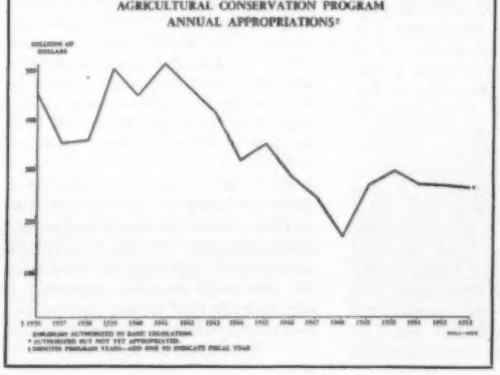


Figure 1.

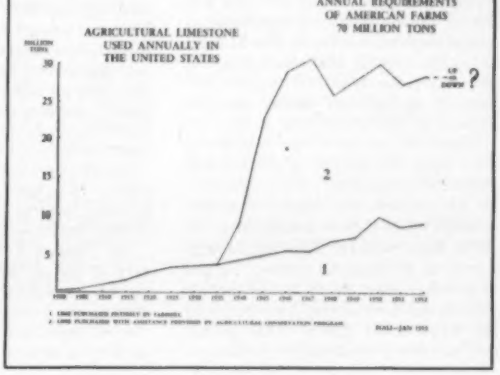


Figure 2.

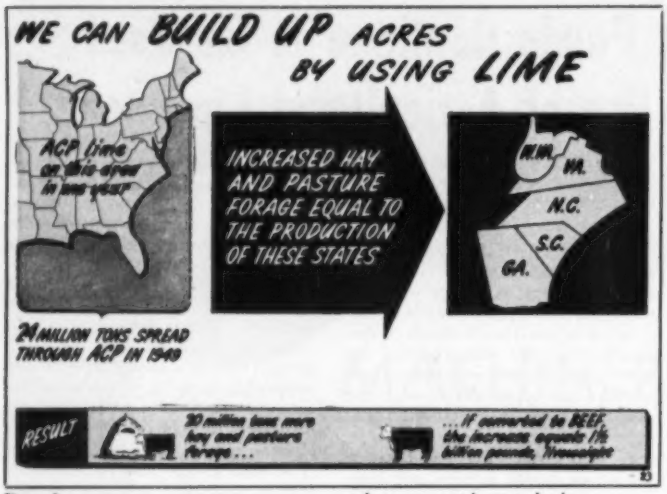

WE CAN BUILD UP ACRES BY USING LIME
ACP Lime on this area in one year
INCREASED HAY AND PASTURE FORAGE EQUAL TO THE PRODUCTION OF THESE STATES
N.H.
VT.
N.C.
S.C.
GA.
24 MILLION TONS SPREAD THROUGH ACP IN 1949
RESULT
20 million tons more hay and pasture forage...
...if converted to BEEF, the increase equals 1½ billion pounds, liveweight

Figure 3.

development, etc., but we have not yet found out how to maintain a high standard of living on poor, wornout soils. Yet we continue to rush on with hardly a thought for the fact that we are depleting our soils at a much faster rate than that of any other nation in civilized history.

We have made efforts to arrest this terrific loss of our topsoil, and some have been spectacular—like the Agricultural Conservation Program. Even this Program never reached more than half way to the goals set by our leading conservationists. And now we are told by the present Administration that this Program must be cut in half money-wise and the practice of liming practically eliminated.

Looking into the immediate future, we find that our needs present a colossal task. Most of us realize that our tremendous food production during the war helped to win it. Few remember that these food production records during the war followed the tremendous expansion of our conservation efforts. Could these war-time records have been made if we were using 3,000,000 to 5,000,000 tons of agricultural liming material instead of 30,000,000 tons a year?

Many of us have not considered how food can play a significant role in maintaining peace. Nor have most of us realized the almost fantastic growth of our own population. By 1975 there will be 200,000,000 people to be fed in this country. To put it another way, in 1975 five people will sit down to a meal for every four we have now. Over 7,000 people will sit down to breakfast tomorrow who were not here today!

This means that we must produce 25 per cent more food to insure that our people will eat just as well as they do today. And all this on a rapidly reducing "farm." A few years ago there were 3¼ acres for each person; now there are a little less than 2½; and it will not be long before it is down to 2 acres. Unless we make advances in science, it will take 115,000,000 more acres to maintain our present standard of living. Instead of prospects of adding acres to our Nation's farms, we are losing more out of production each year. Only 175 years ago we had in this nation 500,000,000 acres of fertile soil. We have completely wasted 200,000,000 acres of that land, and there is another 100,000,000 that is washing away today. According to tests at Memphis, Tennessee, in the Mississippi River there flows out to sea on an average day in the year, the topsoil of fifty 40-acre farms.

Yes, we have better machinery, more and better fertilizer, better seeds, healthier livestock, and unlimited agricultural limestone; but we have a staggering production job. And 1975 is certainly not the end of our population growth. The public has a responsibility to see to it that farms which certain of us currently hold for our lifetime are not depleted unnecessarily. It is not just the farmer's economic well-being which is at stake, but the protection of our greatest natural resource—the soil—for the future welfare of our country.

In Figure 2 we have the history of the agricultural liming industry very graphically illustrated. Following the turn of the century, the use of agricultural liming material showed a steady rise from less than 1,000,000 tons annually to 1,500,000 tons in 1914, when the Federal Extension Service was founded. From this time until 1936 the county agents, particularly in the eastern part of the country, stressed the importance of lime in connection with sound agronomic practices. And yet, even with this excellent battery of promotional men, the total national usage of liming material never exceeded 3,800,000 tons.

It was not until the advent of an incentive-payment type of program that the use of agricultural limestone increased spectacularly to a peak of 30,000,000 tons. The annual usage has fluctuated because of lower appropriations or restrictive regulations prescribed by state or county committees. The total has not fallen off as much as the lower appropriations would indicate because farmers have been buying more each year without government assistance. But if, as some maintain, farmers have now been shown the benefits of liming and therefore need no further incentives, why is it that the use has leveled off where it has? Instead of buying approximately 10,000,000 tons outside the A.C.P., why don't farmers buy closer to the 70,000,000 tons our soil specialists say we should use annually? We *would* be using 70,000,000 tons if all farmers used liming material at the rate many of our top farm managers are currently applying. The use of 30,000,000 tons of agricultural limestone has not only tremendously improved the conservation of our nation's soil, but has had a most significant effect on our national health by providing substantial amounts of the vital element—calcium—in the many products harvested from these improved acres.

Adequate liming not only neutralizes the soil and supplies essential calcium and magnesium, but it also greatly increases the efficiency of the fertilizer which is used. It has been estimated that the use of limestone in one year has resulted in an increase of 20,000,000 tons of hay and pasture forage that would otherwise not have been harvested. (See Fig. 3) Putting it another way, it has meant 1,500,000,000 pounds of beef that would otherwise not have materialized.

Agricultural limestone has been called the key to our conservation program by the country's leading soil conservationists. Without adequate amounts of agricultural limestone, the efficiency of many fertilizers is cut in half; and in the case of the two most important soil conservation

(*Continued on page* 146.)

WASHINGTON NEWS LETTER

IF prosperity is primarily a state of mind, all of the news coming out of Washington indicates that prosperity is assured at least through 1953.

First of all, there are the preliminary results of the Survey of Consumer Finances conducted annually by the Federal Reserve Board. In this survey persons in a large representative group are interviewed and questioned about their current and expected financial status and about their purchasing plans for the coming year.

While the Federal Reserve Board insists that these surveys do not provide a forecast of consumer expenditures, they have nevertheless proved useful in past years in providing general clues as to the strength and nature of consumer demands. As a matter of fact, when the expectations reported in these surveys were later compared with the realities, they have generally turned out to be exceedingly accurate. The Board reports, "The general conclusion to be drawn from the 1953 survey is that consumers have a confident attitude concerning their financial positions and expect to purchase automobiles and major household durable goods in large volume this year. They also plan to purchase new and existing homes in substantial volume."

The optimistic tone of the report may be seen in the fact that almost half of the people interviewed stated that they were making more money now than a year ago. This is a larger proportion than were willing to say that in any of the three preceding years. Furthermore, more than a third of them reported that they expected to be making more money a year from now than they are making now. If, in fact, these expectations again conform closely with reality, a high and increasing level of consumer purchasing power is assured.

Not only do these consumers report that they expect to have more money to spend, but they also say that 1953 is likely to be a good time to spend it. This judgment is based on their further expectation that prices generally will not rise in 1953. Their attitude in this regard is substantially different from what it was a year ago and two years ago. In 1951, when a similar group was questioned, more than two-thirds of them expected prices to increase; in 1952

By S. HERBERT UNTERBERGER

more than one-half of them expected prices to increase; this year only 16 percent reported that they expected prices to increase, while 31 percent expected a decrease during the year. This notion that prices will probably remain stable or even decline somewhat, probably accounts for the fact that a larger proportion of those interviewed said that they thought 1953 would be a good time to buy.

Businesses Expect to Spend More

Not only consumers but also the managers of businesses expect to have more money to spend in 1953. This is reflected in a survey made jointly by the Department of Commerce and the Securities and Exchange Commission. A large group of businessmen who have been queried on the subject indicate that in 1953 their plans call for spending some $27,000,000,000 on new plants and equipment. This is to be compared with $26,500,000,000 last year and $25,600,000,000 in 1951. Since the price of capital goods has risen only very slightly, if at all, this increase in expected dollar expenditures reflects an increase in the physical volume of additions to productive facilities.

In addition to the government's survey on this subject, the McGraw-Hill Publishing Company has made a study on the same subject, but has carried it forward somewhat. This firm, too, finds that manufacturers plan to boost their capacity in 1953. According to this study, the planned increase would be 7 percent. It went further and discovered that according to present plans, manufacturers expected by 1956 to have boosted their capacity by another 9 percent.

During 1952 the largest increases in capital expenditures were made by the public utilities companies. This trend is expected to continue through 1953. The electric power companies expect to increase their capital expenditures by 15 percent. The gas companies expect to increase theirs by 11 percent. Other industries which are likely to be in the forefront are petroleum, chemicals, paper, beverages, and machinery. Falling behind the procession will be iron and steel, nonferrous metals, and non-automotive transportation equipment.

Incoming Orders Continue High

Both the consumer and capital goods expenditures which are planned would probably be cut back if the volume of business failed for some other reason. Here, too, the available evidence seems to indicate that no such decline is likely in the immediate future.

Manufacturing output, which has been exceedingly high in recent months, has, according to the Department of Commerce, been matched by the rate of incoming orders. Backlogs, therefore, have held at about the same level for many months. A survey of unfilled orders of major durable goods industries indicates that three years ago they amounted only to $19,000,000,000, that last year they amounted to $64,000,000,000, and that this year they are up to $70,000,000,000. Furthermore, the ratio of unfilled orders to sales is the same now as it was a year ago.

Capital Goods Boom and Taxes

Now that Washington has returned to more conservative economic thinking, a great deal more attention is being given to the capital goods industries. There is a general feeling that if the demand for capital goods is maintained, the economy will continue to operate at a high level. There is also a general feeling that the developments in the fields of taxation will encourage that demand to remain high.

Among these developments, the most likely to occur soon is the elimination of the excess profits tax. This will free substantial funds. The managers of corporations will have the choice between distributing those funds as increased dividends or employing them for future expansion of the business. It is likely that they will do a little of each. Particularly in growing businesses, which were especially hard hit by the excess profits tax, its elimination will provide a breathing spell. Additional funds available will give their managers the opportunity to invest in things which they have needed for a long time, but which they could not buy because so great a proportion of the profits they made were earmarked for the government.

In addition, there is some possibility that the tax laws will be amended so as to permit more rapid depreciа-

(*Continued on page* 146.)

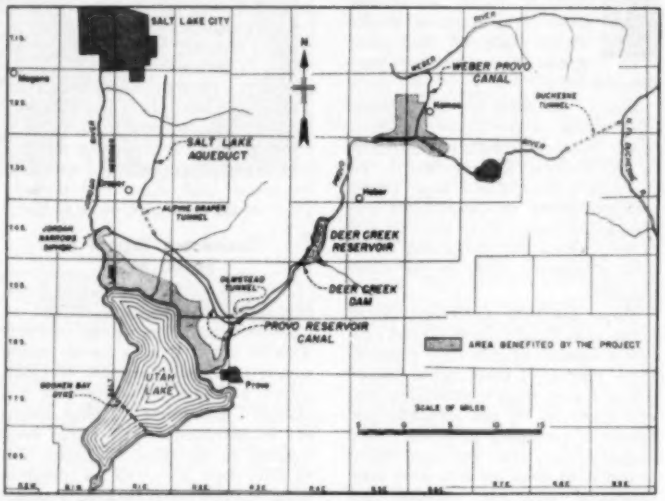
Dallas and Los Angeles Firms Processing Provo River Gravel For $4,380,000 Tunnel Job

THE Provo River Project, largest reclamation development in the state of Utah, will serve more than half of the state's total population by providing a supplemental water supply for irrigation, as well as an assured domestic supply for the metropolitan water districts of Salt Lake City, Provo, and a half dozen other important communities in the Salt Lake Basin.

By HARRY F. UTLEY

The plans for the project were developed over the last 20 years and several phases were undertaken and constructed before World War II, until scarcity of men, materials, and funds caused much of the remaining work to be stopped for the period of hostilities. One of the last portions of the project, the Duchesne Tunnel, was halted by the W.P.B. in December, 1942, after about 2½ miles of the 6-mile bore had been holed through. (A description of some of the early work on the aqueducts for this project was published in the March, 1941, issue of PIT AND QUARRY, pp. 95-97.) It was nearly eight years later before the tunnel job was reactivated, and it is now near completion.

Located about 60 miles east of Salt Lake City as the crow flies, the tunnel will transfer into the Great Salt Lake Basin the water not used or required in the Colorado River Basin. The tunnel taps the north fork of the Duchesne River east of the Wasatch divide and empties it into the Provo River west of the range.



Map of the Duchesne Project, showing the location of the Duchesne Tunnel at the upper right.

Contract for finishing the remaining portion of the tunnel and concrete-lining it in its entirety was awarded jointly to the Grafe-Callahan Construction Co., Dallas, and Rhoades Bros. & Shofner, Los Angeles, at a bid price of about $4,380,000. One of the first steps was to open a pit and erect an aggregate-processing plant. This 150-t.p.h. plant went into operation on August 1, 1951, and ran with some regularity until October of that year, producing about 28,000 tons of washed and sized material before the early freeze-up. After the 1951-52 winter, unusually severe in this rugged country, the plant went into operation again in May, 1952, in the expectation of completing the processing of about 105,000 tons required by the end of the summer and fall season.

The sand-and-gravel deposit is located on the upper reaches of the Provo River. It was selected by the contractors because of its proximity to the concrete plant near the west portal of the tunnel and was approved by the Bureau of Reclamation for soundness and non-reactivity, although there is a great deal of clay present.

The plant, which is of steel construction, was designed by Howard W. Woods, project engineer for the contractor, assisted by the Conveyor Co., Los Angeles. The latter concern built the structures and supplied much of the equipment.

Excavating in the pit is done by a Northwest 1½-cu. yd. diesel shovel, Ford F-8 6-cu. yd. dump trucks delivering to the plant hopper. A 42-in. by 6-ft. plant-built reciprocating feeder puts the pit run over a Symons 42-in. vibrating grizzly that rejects all plus 3-in. material, which is wasted. Three of the fleet of six dump trucks are ordinarily in pit-to-hopper service, the other three being kept busy hauling away the waste

An overall view of the aggregate plant operations on the Duchesne Tunnel Project in Utah.

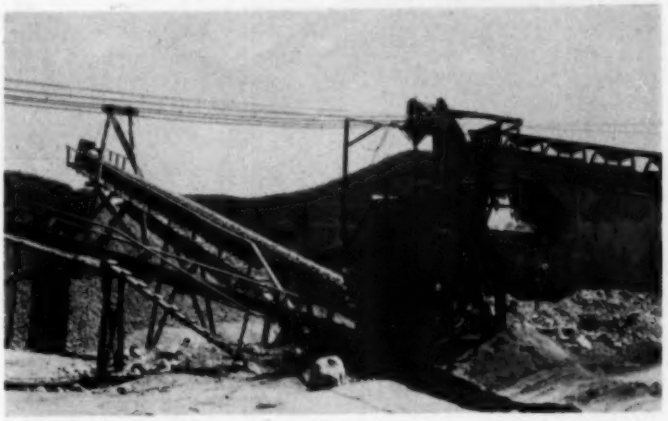
boulders. The minus 3-in. gravel and sand are then carried by a 24-in. by 72-ft. belt conveyor to a Symons rod-deck screen with ¾-in. openings. Throughs go to a 1000-ton live-storage surge pile for processing in the sand department.

Rod-deck screen rejects, in the plus ¾-in. minus 3-in. range, are likewise stockpiled, recovered, and sent to a Symons 4- by 12-ft. triple-deck sizing-and-washing screen, where the finished gravel is classified. The 1½-in. mesh top deck serves as a scalper, the retained material going to a Symons 3-ft. cone crusher in closed circuit with the screen.

The minus ¾-in. stockpile which supplies the sand department is equipped with a tunnel recovery belt which delivers to a Symons 4- by 10-ft. spray-equipped screen. Any plus No. 4 coarse material is rejected at the screen and returned to stockpile at the gravel department for blending purposes. Throughs pass to a Conveyco sand-washing and classifying box, compartmented to settle out sand in three mesh ranges —No. 4 to 16, No. 30 to 50, and No. 100 to pan. Dirty water overflows the box and passes to three settling ponds in series before being discharged into the river. From the classifier, the sand is flumed to a Conveyco dewatering wheel, after which it is stockpiled for delivery to the concrete plant. Bureau specifications call for approximately half the sand to be in the No. 16-50 range, about a third in the No. 4-16, the balance in the minus No. 50 classification, with an F.M. spread of 2.50 to 2.80. The plant is able to meet the requirements nicely, except that there is a surplus of No. 8 and coarser, which is wasted, the overrun being as much as 20 percent at times.

A fleet of five dump trucks is in service delivering the finished aggregates to a tunnel stockpile at the Heltzel concrete plant about 1,300 yd. distant where, before being binned, all coarse material is re-screened by a Pioneer 4- by 12-ft. two-deck screen. The concrete plant is largely automatic in operation. It is equipped with a 2-cu. yd. weigh-batcher, and has 400-cu. yd. bin capacity in four compartments. Type I bulk cement, plus air-entrainment additives, is used in the mix, and a dual-drum mixer is able to supply concrete almost continuously to the concrete cars, each of which carries

The vibrating grizzly at the receiving hopper rejects plus 3-in. boulders, which are hauled away to waste by a dump truck.



A rod-deck screen receives pit run from the conveyor at the right, the stackers at the left building up surge piles of gravel and sand, split at ¾ in.

The gravel washing and sizing structure, with bins beneath the screen and the cone crusher in closed circuit via the return belt.

The sand screening and washing tower with the conveyor to the truck-loading bin at the right. The tunnel-recovery conveyor from the raw surge pile is at the left.

This view of the sand department shows the compartmented classifier and (right) dewatering wheel.

one-half cubic yard to the point of lining activity within the tunnel.

The aggregate and concrete plants are electric-powered, 36 miles of transmission line having been strung especially to bring the current to the construction site from a high line of the Utah Power & Light Co.

B. A. Peters is the project manager for the contractors, whose offices were set up in a vacant commercial building in the town of Kamas, 18 miles west of the plants. E. O. Larsen is the regional director for the Bureau of Reclamation, with headquarters in Salt Lake City.

Public Funds for Agstone

(*From page* 142.)

crops—clover and alfalfa—it is not unusual to have a complete crop failure when adequate amounts of lime are not applied.

However, the goal in our nation is not how we can maintain the use of 30,000,000 tons of agricultural limestone but rather how we can *increase* this use. The Land Grant College-U.S.D.A. Joint Committee on Agricultural Productive Capacity has said the annual usage on American farms should be 70,000,000 tons. Instead of cutting our present incentive-payment program, we should be looking for ways to expand the use of agricultural liming material more nearly in line with what our leading conservationists say we should use.

Cutting taxes is what everyone is interested in, and so continuing a conservation program but at a reduced rate (reduced from $250,000,000 to $140,000,000) is popular. Construction practices like terracing, building water ways and dams, drains, etc., are all important in their place. But they are not the total answer to our national conservation problem. Furthermore, if we believe in democracy, we must take into account that when farmers were free to select the conservation practices they wanted, the use of agricultural limestone ranked first. It was first in the number of farmers who elected to use it throughout the country and first in the amount which they allocated from their farm conservation allowances to any single practice.

The Congress of the United States will make the final determination of the scope of the nation's conservation effort. The 1954 Agricultural Conservation Program will be based on the amount of money authorized by the Congress in the next few weeks. The U.S.D.A. Appropriation Bill will reach the House floor about the middle of May. Senate floor action will be several weeks later.

Washington News Letter

(*From page* 143.)

tion. This, too, would probably serve as an incentive to further expansion of plant and equipment. There is good reason for being timid about investing in a plant or machine to make a product whose demand is uncertain to continue for a long period of years unless the value of the machine, too, can be written off in the same short period. There is a very real drive afoot to permit companies much more freedom in deciding their own depreciation schedules. Contributing substantially to this move has been the rapid amortization permitted recently for so-called defense equipment. It has become increasingly difficult to distinguish between what is necessary for defense and what is not. The inequity created between companies which are able to secure "Certificates of Necessity" and those unable to do so is far clearer to the businessmen now running the government agencies.

Maule Industries, Inc., has purchased the Miami Crushed Stone Company and its subsidiaries—the Materials Sales Corporation, the Peninsular Concrete Company, the Hadley Supply Company, and Tropical Farms. In addition to acquiring the plants and properties of Miami Crushed Stone, Maule Industries has announced an expansion at its Broward quarry, near Fort Lauderdale.

Operation of the Blair Quarries, Blair, S. C., has been taken over by Palmetto Quarries Company. The Blair operation will become Palmetto Quarries Company, Blair Plant, Columbia, S. C.

Installation and Maintenance of Anti-Friction Bearings

Part III
BEARING FAILURES AND THEIR CAUSES

By JOSEPH BRUSCA
Senior Division Engineer
SKF Industries

Just as a doctor cannot effect a lasting cure unless he knows the cause of an illness, the engineer must know the reasons for a bearing failure before he can correct such condition.

While ball and roller bearings have proved by long experience to be much more reliable and to need less attention than bearings of other types, the principles governing their use are necessarily quite different from those applicable to plain bearings. Therefore, it is of utmost importance to draw the right inference from bearings failures.

Sometimes, this can be done very quickly by a casual inspection of the bearing and the condition surrounding the application. Other times, it is necessary to make a complete laboratory examination before the cause can be determined. In addition, there are times when the condition of the failed bearing is such that the actual cause of failure cannot be definitely established and an exhaustive study of the application and all conditions surrounding it must be made.

It is not our intention to try to cover this important subject in complete detail, but there are common conditions of bearing failures which may link with the type of application. These may help you determine the cause of early failure and suggest remedies to prolong the bearing life.

Failures Due To Dirt One of the common causes of bearing failure is dirt. Bearings which fail because of dirt can be recognized in several ways. Generally, fine dirt in a bearing acts as an abrasive and causes lapping of the bearing parts. This can be seen and felt in the ball or roller paths of the self-aligning type bearing. These paths will be polished as will the balls and rollers. If there are no breaks in the surfaces of the rolling elements and the ball or roller path is clearly defined, then you can be sure that fine dirt was in it during service.

Bearings of the deep-groove type are not as easily examined since the ball paths and the balls cannot be readily seen. A preliminary check can be made by feeling the amount of clearance between the inner and outer races. This can be done by laying the bearing on a flat surface and holding one ring stationary. If the other ring can be moved in a position parallel to the flat surface, wear has taken place. Do not attempt to feel wear in a bearing when holding it in your hands. In this position, it is possible to feel the normal internal clearance which might be mistaken for wear.

You must remember that ball and roller bearings do not wear, even after long service, if they are kept clean and are lubricated properly. When they have reached their fatigue-limit, flaking of the loaded areas occurs. This flaking is not considered wear in the same sense that we consider wear caused by abrasives. Many worn bearings have to be discarded long before the fatigue limit of the steel is reached.

If water or other corrosive agents enter the bearing, wear will occur very quickly. The iron oxide formed by rust is an abrasive and will lap or grind the balls or rollers undersize. Sometimes a bearing will become corroded before it is put in service. A motor or pump or some other machine may be flooded or water may be introduced with the lubricant. In a case of this kind, corrosion *pitting* will occur and is distinguished by its dark brown color. This pitting will be where the balls or rollers contact the races. It will cause the bearing to be noisy and since the machine has just been put into service, the user will immediately blame the bearing.

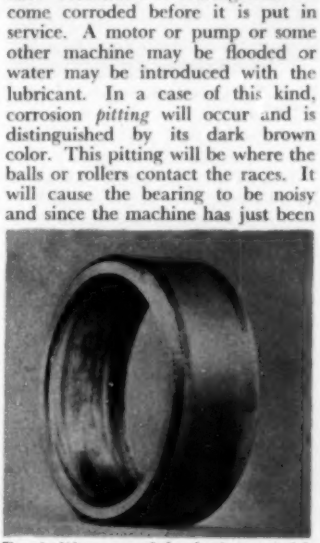


Fig. 1. Wear caused by foreign material.

If examination of a bearing indicates that wear has taken place, the actual application should be carefully checked. You may find a quantity of hard, gritty particles, such as produced by a grinding wheel or a buffing stand. Seals should be checked thoroughly to make sure that dirt is not going past the seals and into the bearing. The lubricant should be checked as well as the method of lubricating the bearings. Slipshod maintenance methods could be the reason for dirt getting into the lubricant and then passed on into the bearing.

Fig. 2. General appearance of corrosion.

Sometimes a simple, inexpensive shroud or sheet metal box can be used to deflect the dirt away from the bearing house. This will pay for itself many times over.

The same conditions are obtained with respect to water or other corrosive agents entering the bearing housing. Everything possible should be done to deflect such fluids away from the openings of the bearing housing.

Another form of foreign matter may get into the bearing in the form of chips or particles of steel because

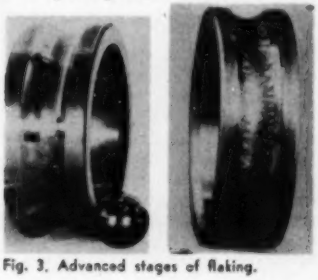


Fig. 3. Advanced stages of flaking.

of failure of another part of the machine—such as a gear. Such chips in the ball path will be pressed into the races and balls causing dents or scratches.

Failures Due To Improper Lubrication A common cause of early bearing failure is inadequate or insufficient lubrication. The amount of lubricant required by a ball or roller bearing is small. That is why so many of these bearings, unlike the majority of plain bearings, can be lubricated with grease. While the amount required may be small, the quality should be the best obtainable.

Some applications involving high temperatures, high speeds, very heavy loads, etc., require oil lubrication. In some instances, special methods are used for oil lubrication, such as "circulating oil," "oil mist," "drop feed," etc.

Lack of lubricant is revealed by a high pitch sound and a rapid rise in temperature. (A rise in temperature can also be the sign of over-lubrication). Failure to correct this fault immediately is apt to be followed by damage of different kinds. Intense overheating will draw the temper of the bearing steel, the parts will become soft and the bearing will fail very quickly. This condition can quickly be recognized by the color of the bearing which in the early stages will be blue. If the bearing is forced to continue to operate, it might seize and result in damage to other parts.

Lack of lubricant may cause wear of the cage, accompanied by smearing of the balls or rollers and their tracks in the rings.

Grease whose consistency is too solid, or oil that is too thick, is capable of producing a braking effect powerful enough to make the rolling elements slide. Such sliding will cause smearing of the effected parts and early failure occurs.

Fig. 4. Defective or absence of lubrication.

Very rapid starting of a machine is an adverse condition for an anti-friction bearing. Where the load is heavy, a condition such as the one described in the foregoing paragraph occurs. This smearing takes place because of the sliding of the parts before the running temperature has been reached and while the grease is still solid. This is particularly true where bearings operate under low temperature conditions. Where the load is light, the inner race slides or skids on the balls or rollers before they have a chance to rotate and smearing again takes place. Under both conditions, the bearing will continue to operate but will become noisy and eventually will fail.

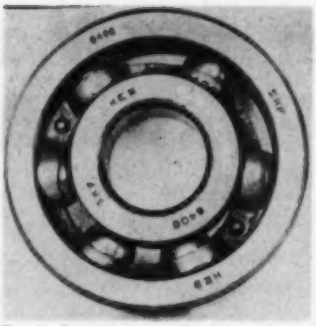


Fig. 5. Eccentric wear of retainer due to poor lubrication and foreign matter.

Failures Due To Shafts And Housings If the specified shaft diameter is exceeded, or the housing bore undersize, the internal radial clearance of the bearing may be removed due to the expansion of the inner ring and contraction of the outer ring.

Fig. 6. Flaking from smearing due to defective lubrication.

Both of these conditions will cause an overload of the bearing, and flaking (it is sometimes known as spalling) of the races or balls takes place. This condition may be recognized by the appearance of the parts under load—their surfaces are chipped and flaked. It differs from wear since it is rough, rather than smooth. This is the normal way for a bearing to fail after long service under load. If it takes place in a short period of time, then the bearing has been overloaded by some outside cause.

Normal fatigue failures generally show a load track around the circumference of one ring and over one section of the other. Should the load track appear at two or more places in the one race, then internal loading is the cause.

For example, if the bore of the housing is out of round or undersize, the outer race will be squeezed out of shape, causing overload. If a cartridge mounting, the housing bore may be correct when disassembled but if the cartridge is put into a machine frame which is bored undersize, it may be squeezed out of round.

It is easy to pinch a bearing when a split housing is used. This pinching may occur because the bore diameter of the two halves is smaller than the diameter of the outer ring. Then, when the two halves are bolted together the outer ring is squeezed out of round.

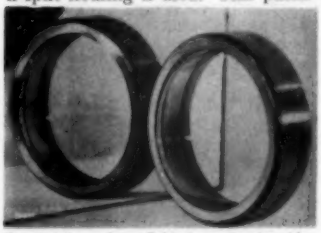


Fig. 7. Mirror shows flaking on opposite sides of bearing ring. Cause: distortion of ring by housing.

Distortion of the housing bore may occur if the pedestal on which the pillow block is bolted is not straight or smooth. The dimension of the housing may be correct, yet it is possible to pinch a bearing in a split housing if the bearing is not *seated* squarely in the bearing seat. If the cap is bolted down with the bearing in this position, pinching will take place across the diagonal corners of the outer ring.

The loading of bearings which are pinched in their housings because of cocking is very evident upon examination. A definitely defined load track will be noticeable on opposite sides of the outer race across the same diagonal where the pinching occurred.

Bearings mounted on a tapered shaft or on a tapered adapter sleeve can be overloaded at the time of mounting. If the inner race is forced up on the taper too far, it will expand excessively and the normal internal radial looseness in the bearing will be removed. When mounting ball bearings of this type, care should be exercised to rotate the outer race when the bearing is forced up on the taper. When it starts to bind to the smallest degree, the inner race has expanded as much as it should. In a spherical roller bearing, both the amount of initial internal radial clearance and the necessary expan-

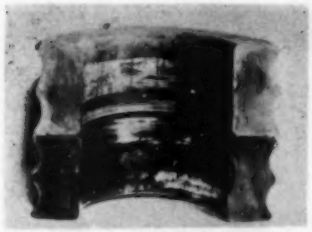


Fig. 8. Smearing of inner race bore due to slipping on shaft.

sion of the inner ring, when mounted on a tapered shaft or sleeve, are such that the decrease in internal clearance can be measured with a feeler gauge. Thus, you can be sure the reduction is in accordance with specifications given in catalogues.

Extreme care must always be exercised to insure proper shaft and housing fits. Undersized shafts and oversized housing bores will also cause early bearing failures. An undersized shaft will permit the inner ring to rotate on the shaft—while an oversized housing bore will permit the outer ring to spin in the housing. Both conditions will cause heat, smearing of the parts that rub, and rubbing cracks—all of which may lead to early failure.

Failures Due To Mounting And Abuse Misalignment of either race of a deep groove bearing will impose an undetermined load on the bearing. This load, together with the normal load on the bearing, will cause an overload resulting in early failure.

Misalignment also imposes undue stress on the retainer. In fact, this condition and poor lubrication are the main causes for retainer failures. If misalignment is present, it will be indicated by a ball track not parallel to the edge of the groove. When the misaligned path is in the outer race (in applications where the inner race rotates) then the bore of the housing is not parallel to the shaft. If the load path in the inner ring is not parallel with the edge of the groove, it is generally due to the inner ring being cocked on the shaft, the shaft shoulder not being square with the bearing seat, or the shaft may be bent.

Sometimes a condition like this can develop in the case of a cartridge housing mounting. The bearing may be mounted perfectly in the cartridge but if this unit is not bolted squarely to the machine frame, misalignment may result.

Another cause of initial overloading is an opposed mounting which binds the outer races and causes excessive thrust. Most mounting designs require that one bearing be held within its housing shoulders while all other bearings on that same shaft are allowed to be free to float in the housing. However, there are mounting designs which require that the outer races of two bearings be opposed, i.e., opposite sides of the two bearings are mounted against the shoulder of each housing. The spacing between these housing shoulders must be quite accurate in relation to the distance between the bearing shoulders on the shaft. Otherwise, excessive initial end thrust will be imposed on the bearing.

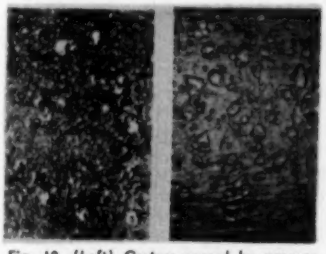


Fig. 10. (Left) Craters caused by passage of electric current through bearing. (Right) Burns due to arcing. (Highly magnified).

Pitting due to electric action causes noisy bearing operation. This occurs in electric motors and generators when electric current passes through the bearing from the frame to the shaft. An actual crater is burned in the steel by the arcing of the electric current. When the condition is very bad, these craters can be seen with the naked eye. Smaller ones require high magnification.

Bearings can become ball dented and when operated in this condition will be very noisy. Ball denting or brinelling is caused by excessive pressure on the races through the balls when the bearing is not rotating. It commonly occurs in small bearings that are mounted in the housing while the inner race is on the shaft. If the outer race is tight or becomes cocked in the housing and pressure to force it into position is applied through the inner race, such impressions are produced.

Fig. 12. Ring cracked by forcing on oversized shaft.

When the impact is in an axial direction, the balls can be forced against the edge of the groove which in turn, nicks them. Ball dents are easily distinguished from dents produced by chips or dirt because they are usually spaced the same distance apart as the position of the balls. Ball dents can be produced in the bottom of a groove if sufficient impact goes through the balls in a radial direction. If a motor is dropped from a shelf to the floor and the overhanging end of the shaft strikes first, then denting of this nature can take place.

Another condition similar to ball denting is known as pocketing or false brinelling. In this condition, the pockets are also spaced the same distance apart as are the balls or rollers and because of this, it is often confused with denting. The cause, however, is entirely different

(Continued on page 166.)

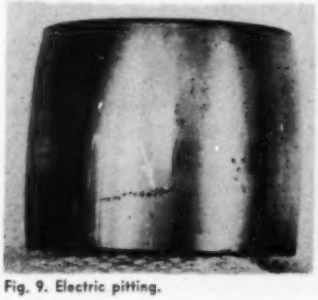
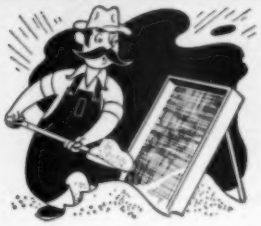


Fig. 9. Electric pitting.

Fig. 11. Wear, similar to ball denting, due to vibration while the bearing is stationary.

Fig. 13. Ring cracked by hammer blows.

Screenings



by William M. Avery

CONCRETE, which is by all odds our favorite construction material, has been making interesting headlines lately at widely separated points and for widely divergent, but for the most part creditable, reasons. The following samples are fairly typical.

A Londoner, who fell head first onto a concrete pavement 20 ft. below the scaffold on which he had been working, was quickly revived by fellow workmen and resumed his duties. Either hardheadedness is not an exclusive monopoly of the Dutch, or somebody has at last managed to put some bounce in concrete.

The city of Louisville, Kentucky, has announced its intention to re-outfit its 74 tot-lots with concrete pipes and steps for small fry to crawl

through and climb, and toys like concrete model locomotives for them to play with. This test should settle for all time any question as to whether or not concrete can stand up under the most severe punishment imaginable.

Out in Wyoming the citizens of Cheyenne have forked up $4,500 for a modern concrete masonry building to replace a substandard dog pound. To invert an ancient bromide, it appears that a dog's best friend is his man.

When a group of South Dakota patriots swiped the bones of Sitting Bull from a North Dakota grave the other day, they reburied the remains on their own side of the border in 20 tons of concrete to make sure that the old boy's wandering days were over. We hope the technicians in charge understood the importance of using a stiff mix.

According to the Lawrence *Dragon*, a Philadelphian has developed a scheme for stuffing fish with concrete at a cost of about 40 cents per unit, compared with $6 for professional taxidermy. It's just barely possible, of course, that you could get enough perfume for $62.60 to neutralize the dead fish aroma, but we don't propose to try the method on anything larger than a guppy.

Higher Mathematics

SEEMS to us sort of bad manners for the Republicans to start counting the till so soon after taking over command of the Federal Government, but we refuse to let this aspect of the affair dampen our admiration for the ingenuity they have brought to bear on the task. For example, they speeded up their

check of the gold bullion stored at Fort Knox by counting only 10 percent of the stuff. Any idiot, of course, knows how to compute the whole when 10 percent of the whole is known, but that still doesn't explain how the Republicans found out about it.

Pilgrim's Progress

FELLOW who heads the geology department of Harvard University recently advanced the theory that Plymouth Rock once rested 25 or 30 miles east of its present location. He believes that the historic rock, on which the Pilgrims may or may not have landed, was dragged by a glacier some 50,000 years ago from what is now the bed of the Atlantic ocean. Anyhow, we're mighty glad there isn't any evidence to indicate that the lads of dear old Harvard were guilty of an abortive attempt to drag the thing into Cambridge.

Certitude

WE understand that researchers at Oberlin College are seeking clues to weather conditions by means of exhaustive study of rock cores. Cores obtained from considerable depths below the desert floor of New Mexico are expected to provide detailed information concerning wet and dry seasons which occurred half a million years ago or more. Regardless of the outcome of this cosmic undertaking, we feel pretty sure that tomorrow's weather will bear no more resemblance to the forecast than it ever did.

First Things First

WE understand that the Oregon legislature is currently engaged in spirited debate on a house bill which includes the following provision: "No person shall drill, dig or otherwise excavate, or have drilled, dug or excavated, any well or hole more than 10 ft. in depth, and less than 10 or more than 6 in. in diameter, without first completely filling the well or hole from its bottom to the surface." Any questions?

Butter Fingers!

THE following item appeared in a recent issue of the *Boston Traveler:* "A 6-year-old Lynn boy was rescued from a water-filled clay pit near his home by a former Lynn city councilman who formed a two-man human chain, but fell through the ice himself during the rescue."

On those split personality deals, one half or the other is bound to be vulnerable.

Construction Firm Builds Plant to Supply Its Own Source of Aggregates

ON THE SPOT

PRODUCERS of crushed stone in increasing numbers are finding it advantageous to utilize their own products by going into sidelines such as bituminized aggregates, agstone, ready-mixed concrete, concrete prod-

By WALTER E. TRAUFFER

ucts, etc. Such combinations as a result are now quite common. It is unusual, however, when the reverse procedure is followed, and a manufacturer of one or more of these products enters into the production of crushed stone on a large scale. An outstanding example is the Fitzgerald Bros. Construction Co. of Troy, N. Y., which has been engaged in road and bridge construction for many years and which operates an aggregate-bituminizing plant at Watervliet, on the west bank of the Hudson River across from Troy.

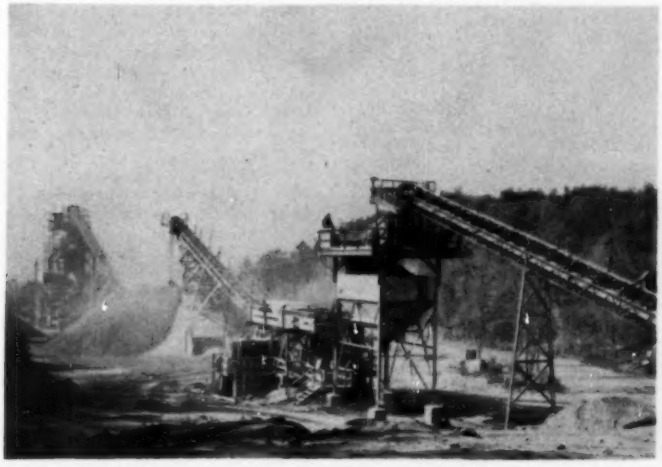
For many years this company had purchased the aggregates needed in both businesses but finally these demands grew to such an extent that it became advisable, for economic and other reasons, to provide its own source of aggregates. For one thing, most of the quarries in this area had their own black-top plants; so it was sometimes difficult to obtain the desired sizes in sufficient quantities when they were needed. As a result the company decided to build its own plant. This 110 t.p.h. operation was started up in August, 1951, and has operated at capacity ever since, with about 70 percent of the output being used in company projects. Operations are shut down only from late December to about April 1 because of the heavy snow in this area. The plant is located on New York State Route No. 2 just east of Cropseyville and about 10 miles east of Troy. It was designed by the Smith Engineering Works, which also supplied most of the equipment, in cooperation with Edmund Fitzgerald, vice-president and operating manager of the company.

The plant is a simple straight-line operation designed for the production of certain desired sizes of crushed stone, with maximum economy, yet with sufficient flexibility, to produce practically any sizes for which a demand might develop. An interesting feature is the use of a surge stockpile, with reclaiming tunnel conveyor, between the secondary crushing department and the final screening and recrushing department. With this arrangement it is possible, when producing the regular run of products, to operate the crushers and screens ahead of the surge pile at certain openings, making any adjustments necessary in the screens and crushers following the storage. The pile also provides a cushion against delays at either end as it has a live capacity for one day's operation and additional dead storage capacity for several more days. Only four men are required to operate this plant, including the truck loader. In addition, there are at the quarry two drillers, two helpers, the shovel operator, and the two truck drivers.

William Dunn, left, is superintendent, and Earl Wagar is master mechanic at the Fitzgerald aggregate plant.

The deposit is a hill of hard and abrasive trap rock which is known to be at least 500 ft. in depth. The quarry was opened near the top of this hill with the idea of cutting a layer across the top and opening successive benches at lower levels. Wagon drills are now being used with a face of about 27 ft. maximum height, but as operations progress and the face gets higher, it may become advisable to use well drills. The formation is solid but has some shallow dirt pockets. These, with trees, form all the stripping necessary. The present quarry level is about 160 ft. above the plant level, which in turn is considerably above the highway level; so all loads are carried downhill.

Primary drilling is being done with two Ingersoll-Rand wagon drills using 1¼-in. steel and 2¼-in. bits all the way down. Blast holes are spaced 6 ft. apart in both directions. Each drill is connected by rubber hose to an individual James H. Markley Co. portable dust collector. These collectors are doing an excellent job and meet all requirements of the New York state code. The fan of each collector is driven by a Wisconsin gasoline engine. Air for the wagon



A general view of the Fitzgerald plant, showing the scalping and secondary-crushing building, the stockpile, and the final screening and recrushing building.

One of the two wagon drills and its portable dust collector.

The 1½-cu. yd. diesel shovel loading stone into a truck for the downhill haul to the plant.

drills, and for two jackhammers used for secondary drilling, is supplied by an Ingersoll-Rand R600 Mobil-Air portable air compressor, which has ample capacity (600 c.f.m.), even with all four drills in operation at the same time. This is driven by a General Motors diesel engine. Large shots of up to 250 holes in four or more rows are possible because of the remote location and because delay blasting is done. In loading holes, Dupont 60 percent gelatin is used for 2 ft. in the bottom, and the balance is No. 1 Gelex. The holes are hooked up in parallel series with connections at about the center of the hole. The delay caps are from 25 to 75 millisecond delay, and in 4-row shots instantaneous caps are used in the first row, and 25, 50 and 75 ms. delay in the other rows. In 6-row shots the last two rows have 100 and 125-ms. delay caps, respectively. A 250-hole shot will bring down 8,000 to 9,000 tons of rock, and the average yield is about 3½ tons per pound of explosive. Originally an old standard blasting machine was used but this has been replaced by a new type of condenser-discharge blasting machine supplied by Dupont. This Model CD-30 machine has a rated 450-cap capacity and is said to be safer than the old type. Current is supplied by batteries, and the circuit is so arranged that if power is too low to fire the rated number of caps, the circuit remains closed. No physical effort is required, and the terminals remain dead except at the instant of firing. It is said to be almost impossible to fire a shot accidentally.

In the quarry a Caterpillar D8 tractor with a bulldozer is used for cleanup purposes. The stone is loaded into trucks by a Bucyrus-Erie 38B diesel shovel with a 1½-cu. yd. dipper. Hauling is usually done by two 16-ton Mack trucks downhill to the primary crusher ramp.

The trucks dump from the ramp onto a 42-in. by 12-ft. Telsmith apron feeder which in turn discharges into the 30- by 42-in. Telsmith jaw primary crusher. The 4½- to 5-in. product of the crusher is discharged on a 30-in. by 117½-ft. belt conveyor to a hopper at the top of the secondary crusher building. From the hopper the stone goes to a 4- by 10-ft. 2-deck Telsmith vibrating scalping screen. This has 1½-in. wire cloth on its top deck and ⅛- by 1-in. cloth on the bottom deck. Dust through the bottom deck can be discharged direct through a chute to a 45-ton Butler truck-loading bin as asphalt filler.

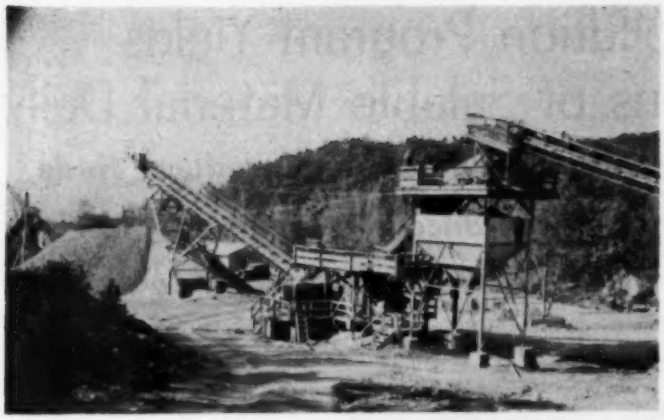
The 1½- to 5-in. oversize from this screen is chuted to a Telsmith 48-in. Gyrasphere secondary crusher. This is set to produce a ¾- to ⅞-in. maximum product. Through this point no changes are ordinarily made in screen openings or crusher settings. The product of this crusher discharges on top of the middle size (⅛- to ¾-in.) and the fines which bypass the truck bin or can be fed from it, onto the 24-in. by 117½-ft. stockpiling conveyor. This is of cantilever construction, so that it overhangs the surge pile onto which it discharges at 40 ft. above ground level. This pile has sufficient live storage capacity to keep the screening department supplied for one day, and the dead storage can keep it going several more days in an emergency.

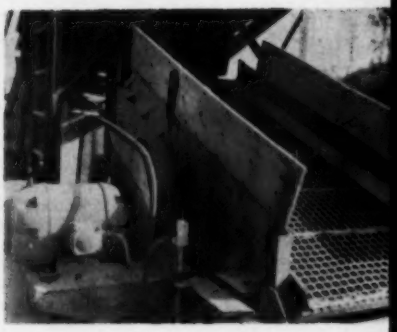
The concrete reclaiming tunnel under the stockpile is 8¾ ft. high by 11 ft. wide and 30 ft. long. Stone is reclaimed through an opening with a 30-in. by 5½-ft. Telsmith heavy-duty plate feeder. A second opening is equipped with a manually-operated gate for emergency use. The 24-in. by 204½-ft. centers inclined reclaiming belt conveyor is enclosed beyond the tunnel and up to a point well above ground level in 8-ft. interior diameter concrete pipe.

This conveyor discharges the stone at the top of the screening tower to a 5- by 12-ft. Telsmith Vibro King

(Continued on page 166.)

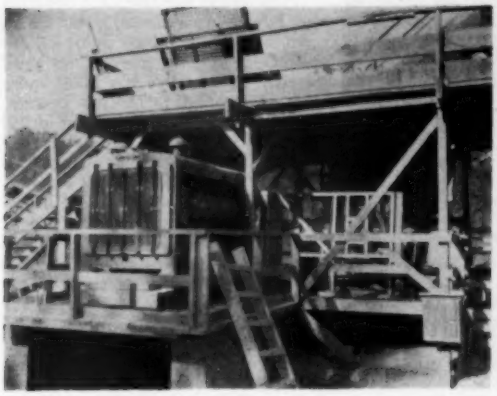
One of the two 16-ton dump trucks discharging its load onto the apron feeder to the primary crusher.



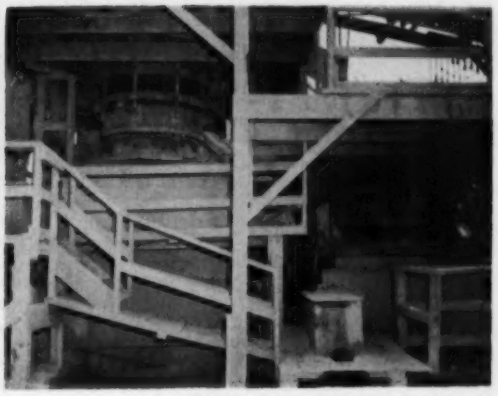


A closeup of the 4- by 10-ft., 2-deck scalping screen.

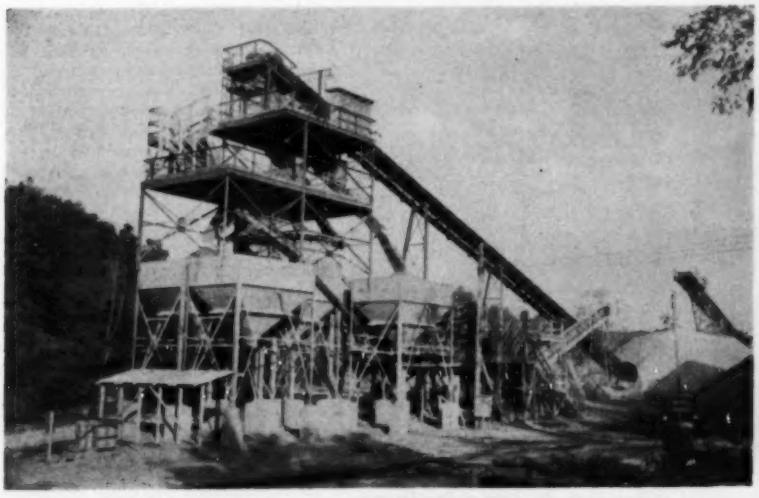
Left: This view shows the scalping and secondary crushing station and the cantilever stockpiling conveyor.



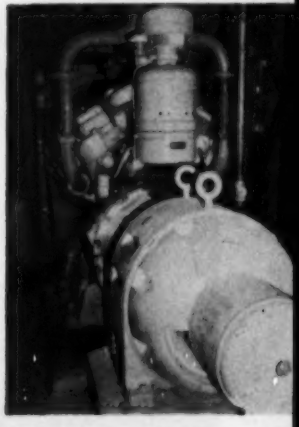
The diesel engine drive of the 48-in. secondary crusher.



The two 36-in. spherical-head reduction crushers, driven by individual diesel engines.



The final sizing station, with stockpiles and the reclaiming tunnel (background), the two sizing screens, and the return conveyor from the two reduction crushers.



The diesel generator set which provides 220-v. current for the motors driving the screens, the conveyors, and the tunnel feeder.

Anti-Stream Pollution Program Yields 100 Tons of Salable Material Daily

Pennsylvania stone producer finds compliance with stringent state law is sound business maneuver

ON THE SPOT REPORT

FOR the past four years at its plant in Ashcom, Pennsylvania, the New Enterprise Stone & Lime Co., Inc., has been reclaiming approximately 100 tons of salable material daily from wash water which had formerly been wasted. The equipment and the methods used in this remarkable recovery operation will be of more than ordinary interest to other producers because of the recent trend toward more stringent anti-stream-pollution legislation in many of the states. Indeed, it was precisely the tightening up of such legislation in Pennsylvania which initially focussed the attention of the New Enterprise organization upon the whole problem of reclaiming a valuable fraction of total plant output.

By WILLIAM M. AVERY

Half or more of all the material produced in the plant is washed, using for this purpose some 10,000 g.p.h. of water pumped from a creek which flows through the property. The quarry deposit from which the plant is supplied has a rough, pocketed surface which makes mechanical cleaning almost impossible. For this reason a considerable amount of clay enters the crushing and screening circuit, and this material must be removed in order to produce salable stone. Reasonably clean stone is also required as feed for the pulverizers in the agricultural limestone plant in order to maintain quality at a high level.

The main job of washing is done with a 30-ft. McLanahan & Stone dual log washer, although some additional cleanup is accomplished with high-pressure sprays located over the vibrating screens which receive material from the washer. The flow is scalped after primary crushing, and it is the minus 1¼-in. fraction which is fed directly to the log washer. The subsequent processing circuit is quite complex, and includes handling facilities which make it possible to produce almost any desired quantity of virtually any size of material.

Material scalped out in the first screening operation is recrushed and screened, and the minus 2½-in. portion is fed to the log washer. There is also a separate 15-in. belt conveyor for refeeding dry materials to the log washer in order to accomplish additional cleaning; such materials are transported by truck to the apron feeder ahead of the primary crusher.

The system was originally designed to handle approximately 60 t.p.h., but over a period of years various units have been speeded up until actual performance has fallen more nearly in the 70 to 75 t.p.h. bracket. With the thorough washing of so large a volume of material it was inevitable that sizable amounts of salable product were lost. In addition, of course, the practice of discharging wash water directly back into the creek unquestionably resulted in some stream pollution, and it was this problem which eventually made it necessary for the company to take action.

Like many similar problems, this one lent itself to a solution which proved to be relatively simple and amazingly sound from an economic point of view. Initially the company installed a 12-ft. diameter Hardinge hydro-classifier which quickly demonstrated remarkable capacity for recovering materials larger than 20-mesh, as well as smaller amounts of finer particles. The unit employs a spiral scraper to convey oversize to a discharge cone at the bottom, from which point an enclosed screw simultaneously elevates and dewaters the material. Fines overflow the rim of the machine, and in the original installation this overflow was discharged back into the creek. The classifier is fed by gravity by means of a 6-in. diameter pipe which carries the material by gravity from a collector located beneath the log washer.

After operating in this manner for one summer it was decided that a two-stage recovery system was actually needed to clean up the large volume of wash water released by the stone plant. Accordingly a 50-ft. diameter Hardinge thickener and clarifier was installed to recover fine material from the hydro-classi-

A view of the 12-ft. diameter hydro-classifier at the Ashcom, Pa., plant of New Enterprise Stone & Lime Co. All wash water from the stone plant is passed through this unit to recover coarse (minus ⅛-in.) material.

fier overflow. This second unit is designed specifically for the separation of mixtures of liquids and finely suspended solids, and a feature of its construction is a spiral scraper which as it rotates continuously cleans the bottom of the tank.

Solid matter separated by the thickener is pumped to an adjacent settling basin, along with the minimum amount of water required for pumping. This slurry-like underflow material is first prepared for pumping by passing it through a Wemco diaphragm pump which is arranged in tandem with a Fairbanks-Morse trash pump. The thickener overflow, which is normally a good deal cleaner than the water entering the log washer, is returned to the creek by gravity.

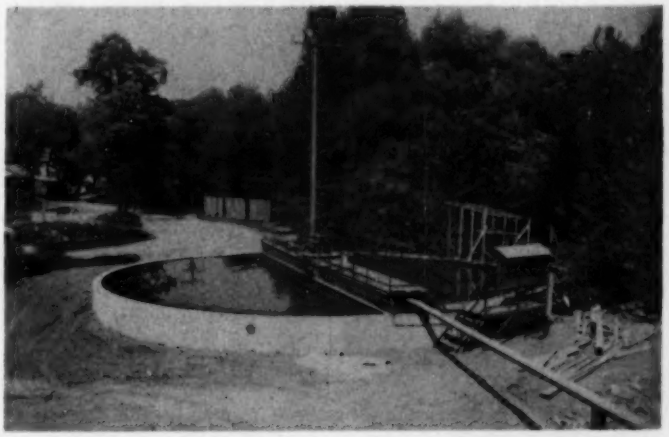
As indicated above, the classifier product is discharged by a dewatering screw conveyor into an adjacent stockpile. This material, all passing the ⅛-in. screen, is not broken down into component sizes, but is either sold just as it comes from the hydro-classifier or used at the Ashcom plant to increase the fines content of modified material. In an 18-hr. day the total recovery of such material amounts to as much as 100 tons. The product is being widely used in the production of concrete masonry units throughout the area.

Some time this year the company plans to install a larger hydro-classifier because the present unit is actually handling far more material than was intended when the installation was made, largely as a result of an increase in plant capacity. The new unit will be an 18-ft. diameter machine of the same make and type as the original, and it will be mounted on the same concrete piers. The 12-ft. classifier will be installed at another New Enterprise plant.

The company has good reason to be well pleased with the results of its wash water cleanup program. The creek has been cleaned up to a remarkable extent, and long-abandoned swimming holes, located below the stone plant, are gradually coming back into use. Sales of the recovered material, moreover, quickly paid for the initial cost of the equipment, and are now an important factor in the over-all picture of plant earnings.

Another interesting development we noted at the Ashcom plant is in the field of dust arrestation. Dust generation at certain critical points in the plant had been quite severe, and in the hope of correcting the problem experiments were begun with a non-toxic liquid diffusion material known as Compound M-200. By means of hand spraying dust at the source, it was found that entirely acceptable control could be maintained while adding less than one half of one percent moisture to the stone.

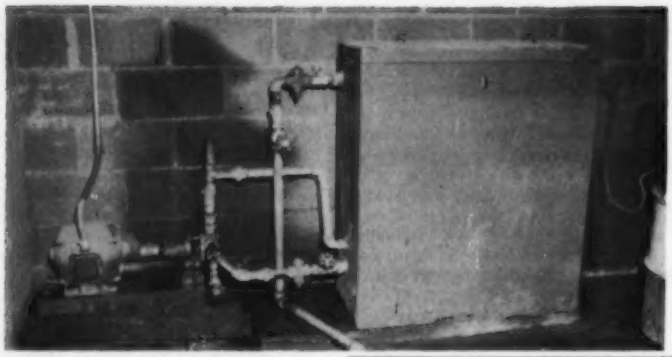
At the time of our visit work was well along on the installation of a Johnson-March dust control system



Fine material which overflows the classifier is settled out in this 50-ft. diameter thickener and clarifier. This unit is fed directly from the hydro-classifier through the 6-in. diameter pipe at the right. Tank has a depth of about 9 ft.

Close-up of the hydro-classifier. Product of this unit is dewatered and discharged by the screw conveyor, which is just visible beyond the basin. Peripheral overflow (foreground) contains very fine material which is caught by the thickener.

Most of the raw water which is passed through the classifier and the thickener comes directly from this 30-ft. dual log washer. Half or more of all the material produced in the plant is cleaned in this manner.



Another interesting new installation at the Ashcom plant is this automatic system for spraying a liquid diffusion material at various points in the plant where dust generation is likely to create a problem.

View of the diaphragm pump which lifts the thickener underflow and prepares it for pumping to an adjacent settling basin.

which will achieve automatically the same results formerly obtained by hand spraying. This installation (see cut) consists of a central storage tank and pump and a piping network through which the diffusion material is delivered under pressure to spray nozzles located at points of maximum dust generation.

In addition to crushed limestone the Ashcom plant produces agricultural limestone, flux, lime, dry-batched aggregates and ready-mixed concrete. The company also operates plants at Canoe Creek, McConnellstown, Orbisonia, Roaring Spring, and Waterside, Pa. Paul I. Detwiler is general manager, Emmert I. Detwiler is director of production, and C. Galen Detwiler is director of administration. Fred B. Bucker is superintendent of the plant at Ashcom.

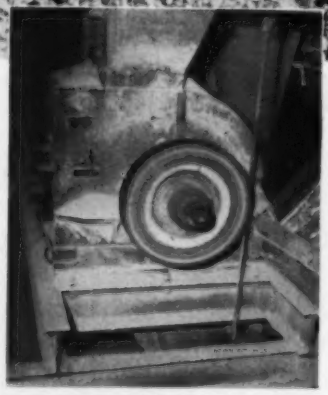
Anti-Friction Bearings

(*From page* 149.)

and is due to vibration while the bearing is not rotating. If a shaft is supported by the bearings in transit and the parts are not bound tightly together, small pockets can be produced in the tracks. Such false brinelling would also be likely to take place if two separate units are mounted on a common base and only one is operated at a time. The vibration caused by running one unit will cause the balls or rollers of the other, which is not running, to jiggle against the races and produce these

(*Continued on page* 165.)

WIN TWO WAYS *WITH* EAGLE



Actual installation photo of 16 x 24 hammermill at Spore, Ohio. Larger units up to size 36 x 42 hammermills. Eagle also makes jaw crushers and truck-mounted loaders.

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CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. Symons Concrete Forming Equipment. Catalog F-8A. The 42-pages of this booklet show many kinds of forms and accessories for concrete forming. Included are details of a forming system that uses standard forms and special hardware to speed up form setting and removal, safety shores for concrete work, and column clamps for forming round, square and rectangular columns. Illustrations of the details of the forms and of actual use are liberally used. Instructions for using the forms are given. Symons Clamp & Manufacturing Company.

2. Thermoid Multiple V and FHP Belts. Form 3787. The eight pages of this catalog show construction details of multiple V-belts and list sizes, prices, and weights. Construction details are brought out. Light duty single belts for fractional horsepower use (FHP) are treated in a similar manner. Conversion tables show the relation of Thermoid numbers to those of other manufacturers. Thermoid Company.

3. Reports from the Field on Trackmobile Savings and Advantages. Bulletin T-100. This six-page folder lists the advantages and savings of using Trackmobiles. Case histories are cited. Several diagrams are included to show interesting applications. Photos show the machine in typical uses. Whiting Corporation.

4. Blaw-Knox Buckets for Cement Plants. Bulletin 2376. This bulletin illustrates and describes a line of tight-lip buckets designed especially for handling cement clinker, limestone, gypsum and other materials moved around cement plants. Construction details, specifications and other information is given about the sizes and weights that are made to meet every handling condition in these plants. Blaw-Knox Division, Blaw-Knox Company.

5. Adams Travelloader. Form 3814. The four pages of this self-contained mailing piece show the machine and typical applications. Sketches point out features described in the accompanying text. Use of the machine in loading from windrows and stockpiles is explained. J. D. Adams Manufacturing Company.

6. Use and Application of Power Cranes and Shovels. This 32-page booklet contains a detailed discussion on the basic principles of power shovel and crane operation. Numerous photos, drawings, graphs and tables are used to show the capabilities of various attachments. The requirements for most efficient operation of these machines are given. Details involved in making a selection of equipment for ordinary operating conditions are discussed in detail. "Safety Considerations with Excavators" and "Excavator Operating Costs" are features that make the book a handy reference work for owners and operators. Koehring Company.

7. The Sight Feed Generator Company. This folder serves to introduce the reader to the company and its products. Portable acetylene generators with sight feed, stationary generators, and mobile units are shown and briefly described. Allied welding products such as Rexarc Automatic Welders and welding rods are included. Portraits of company officials fill the last page. The Sight Feed Generator Company.

8. Model G Plate Magnets. Bulletin No. B-605. A four-page brochure that shows typical installations of the Alnico V magnets used for tramp iron removal. Use and installation of the magnets is given while dimensions are shown by drawings. Erie Manufacturing Company.

9. Sauerman Hoists. General Catalog Section N. Hoists for scrapers in stockpile service, hoists for scrapers in excavating use, hoists for tautline cableways, hoists for slackline cableways, hoist controls and brake and clutch controls are the major sections of this 20-page book. Construction of the hoists is explained and some typical uses are illustrated. Sauerman Bros.

10. Rogers Jaw Crusher. Bulletin 52-1. Portable crushers, feeder-crusher combinations, and stationary crushers are illustrated in this 8-page bulletin. An exploded view of a crusher with text keyed to the features is shown in the center spread. Specifications, dimensions, capacities and product chart are included. General features of the line are explained. Rogers Iron Works.

11. It's Here! the new 15X. SB-6. This four-page folder shows and describes a "no pushbeam" design bulldozer for use on Allis-Chalmers HD-15 tractors. The "15X" bulldozer features an 8 ft. width for highway portability, and 51 in. high moldboard with "roll-action" blade that can be raised 40 in. above ground level or lowered 15 in. below. Other features such as "no pushbeam" design are also explained in the text. The Baker Manufacturing Company.

12. Bergstrom Hard Surfacing Electrodes. The four pages of this catalog insert gives general information about a line of hard facing electrodes and explains the features of them. Specific information about each of the items in the line are given. A list of the rods made and the general application is given. Industrial Overlay Metals, Inc.

13. Euclid Equipment for Moving Earth, Rock, Coal, Ore. Form No. 525. Four types of earthmoving equipment are covered in the 48 pages of this book. The book explains the selection of the proper type of equipment for various types of work and points out the manner in which twin-power—the use of two engines powering separate axles—is employed in some models. Job views of the various types and models are shown as well as large

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illustrations. Specifications and performance figures are given for the various models and individual design features are explained. The Euclid Road Machinery Company.

14. **Pangborn Self-Cleaning Cloth Screen Dust Collectors. Bulletin No. 915.** This six-page brochure illustrates the engineering features of a dust collector unit that uses the principle of reverse air flow for continuous cleaning of the cloth filters. The action of a traveling manifold which includes an integral reverse air blower is explained. Conversion of the type "CH" units into the new self-cleaning "CH-S" is explained. Pangborn Corporation.

15. **Torrington Self-Aligning Spherical Roller Bearings. Bulletin No. 200-C.** The 28-pages of this book are filled with charts and tables showing width tolerance; thread, washer, and locknut data; an interchangeability chart; life expectancy; capacity ratings; life factors; installation and service factors; speed data; loads; fits; lubrication; and other information. All bearings are shown by cross-section drawings. Bantam Bearing Division, The Torrington Company.

16. **The DorrClone, a new tool for sand producers. Bulletin No. 2501.** This 4-page folder illustrates and describes a cylindro-conical unit using centrifugal force for classification purposes instead of gravity. The use of the device in fine sand recovery and in slime elimination are explained. Installation photos and cutaway views bring out the features of the device. The Dorr Company.

17. **PH Mid-Mite (Model 55). Bulletin TX-127.** This large folded mailing piece presents the features of a power shovel of ¾ cu. yd. capacity designed for mounting on any suitable truck chasis. The folder opens to show views of the major components of the machine while the inside spread shows large views of the machine in various applications—shovel, crane, dragline, trench hoe, and other uses. Harnischfeger Corporation.

18. **Link-Belt Machinery For Handling and Preparing Sand-Gravel-Stone. Book No. 2126.** Nearly every conceivable type of machinery for use in sand and gravel and stone plants to handle, separate and classify material are covered by the 64 pages of this book. Among the items covered are: all types of conveyors; elevators; drives; screens of all types; separators; shovels; washers; loading spouts and machines; gates; power transmission devices; scrubbers; feeders; chains; and all kinds of accessories to supplement the equipment listed. Installation photos, drawings, diagrams, and tables give virtually all information needed for a prospective user to select equipment suited to his operation. Link-Belt Company.

19. **Allis-Chalmers Type S Single Stage, Double Suction Centrifugal Pumps. Bulletin 08B6146B.** Sixty-six pump sizes for general water supply, circulating, drainage, and many other applications are presented in the 24 pages of this book. The book provides information on the pumps' construction features, dimensions and head capacities, pumping head data, and friction loss tabulations. Allis-Chalmers Manufacturing Company.

20. **The General Motors Diesel Engine-Torque Converter Unit. 68A24.** This colorful 8-page folder gives the inside story of the G.M. Torque Converter which is now an integral part of a number of G.M. diesel engine models. The booklet is illustrated with cutaway drawings, curves showing the horsepower characteristics of engines equipped with converters, and installation photos showing the application to many fields. The operating principles are explained that provide for smoother power flow and protect engine and equipment from damage as a result of sudden load changes. Detroit Diesel Engine Division, General Motors Corporation.

21. **Continental UST Idlers. ID-113.** This mailing folder is in the outline of an idler. It graphically illustrates the construction of the idler and bearings and the text points out the features of the unit sealed Timken idlers such as sealed lubrication, tapered roller bearings, extra heavy shells and shafts, and malleable iron brackets. Small views show the types that are available in the UST line. Continental Gin Company.

22. **No Shimmy, No Shake.** The inside of this 4-page mailing folder illustrates three models and describes several other Aircheck valves for controlling pressure in air and gas supply lines. The valve acts to limit the flow in one direction and to prevent back flow or loss of pressure. Construction is shown and capacities are listed. Pennsylvania Pump and Compressor Company.

23. **Ultrasonic Reflectoscope. Industrial Application Reports.** These single sheets are designed to show the use of inaudible sound in the inspection of machines and parts. Each sheet in the series gives one case history in a specified field and suggests other uses. The equipment needed is listed and the procedures described. Sperry Products, Inc.

24. **Lima Industrial Motors. Bulletin RS-2.** This brochure presents a line of dripproof induction motors. Dimensions, sizes, construction details, frame number charts, speed-torque curves, and special types and mountings are some of the points covered in the six pages. Gearshift drives incorporating a motor and a sliding gear transmission are listed. The Lima Electric Motor Company.

25. **How the Products of Clark Serve Industry. Form No. 515D.** This pocket size 36-page booklet uses pictures and brief text to present the line made by the company. Front axles, drive axles, axle housings, transmissions, industrial tractors, lift trucks, lift truck attachments, hand trucks and attachments, gears and forgings, and tractor transmission units are some of the subjects covered. The plants are illustrated and a list of dealers is given. Clark Equipment Company.

26. **Attachments for your Caterpillar Motor Grader. Form 30668.** Twenty attachments to increase the usefulness of graders are listed in the 8-page bulletin. Such items as bulldozer blades, lighting systems, scarifiers, snow plows, elevating carriers for loading operations, front end dragline, winterizing equipment and steering boosters are covered. Caterpillar Tractor Company.

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Report on Current Labor Developments

By S. HERBERT UNTERBERGER
S. Herbert Unterberger & Co.
Industrial and Labor Economists
Washington, D. C. - Philadelphia, Pa.

The Demand for an Annual Wage Is Back

In 1943 the fear of substantial post-war unemployment prompted the C.I.O. Steelworkers Union to demand that the War Labor Board order the steel companies to guarantee that each of their employees would not receive less than 40 hours' pay each week. The War Labor Board turned down the demand saying, "The facts . . . indicate that this demand in its present form, would, if granted, subject the industry to such serious financial risks . . . as to be unworkable."

The much heralded post-war depression did not materialize, and guaranteed wages took a back seat while the unions concentrated on increasing wages to keep pace with the cost of living and on pensions and health and welfare programs.

But the demand for a guaranteed annual wage did not die. Early in 1952 the same Steelworkers Union was back, asking the Wage Stabilization Board to order a guaranteed annual wage in the steel industry.

In their new demand they made some concessions to the problem of financial risks which "licked" them the last time:

1. The companies' liability was to be limited to the cents-per-hour amount which they agreed to pay into a trust fund.

2. The guarantee was to cover only employees with three or more years of continuous service.

3. The guarantee was to cost a great deal less since it was to be for only 30 hours' pay per week, and unemployment insurance benefits would be deducted.

It was clear from the outset that the union did not really expect to win its guaranteed wage demand in 1952. Securing an adequate wage increase to keep up with the rising cost of living was still their primary concern. With the defense program in full swing, unemployment was remote and plans for its amelioration were clearly postponable. They included a guaranteed wage demand and pursued it primarily to show the companies and the public that their ultimate intentions in this regard were serious. Again this Board rejected the demand.

Nevertheless, Walter Reuther, recently elected president of the C.I.O., announced to the convention of his own Auto Workers Union that no new contracts would be signed with major auto producers unless they included wage guarantee provisions. It was clear that he expected to be met by bitter resistance; but, it was also clear that his unionists appeared to be prepared to undergo the rigors and hardships of a major strike to attain their goal.

David McDonald, recently elected to fill the late Phil Murray's shoes as president of the C.I.O. Steelworkers, stood beside Reuther and signified his agreement. Nor are the C.I.O. unions the only ones who have shown a renewed interest in guaranteed wages. The A. F. of L. Teamsters, one of the largest and most powerful unions in the country, recently not only made demands for a guaranteed annual wage on the Brown Shoe Co. of St. Louis, but won them. Under the new leadership of the West Coast's vigorous Dave Beck, they plan to repeat the performance.

To be sure, there isn't much Walter Reuther can do about this matter until 1955, when his contract with General Motors and the other principal auto makers come up for renewal. He announced his plans early ostensibly to give them ample time to make their studies, so that they will be prepared to bargain fully, intelligently, and to a conclusion when the demand is first made officially.

Mr. McDonald's contract with U. S. Steel and the other basic steel producers must be renegotiated next year. Interunion rivalry being what it is, it is practically certain that he will try to win a guaranteed annual wage first.

Both of these leaders have strong personal and political reasons for being anxious to win a dramatic new demand. However, the fundamental force behind the move now is the same economic force which prompted the unions to raise the issue strongly toward the end of World War II—the fear of increased unemployment.

Aggregates Producers and the F.L.S.A.

Ever since the passage of the Fair Labor Standards (Wage and Hour) Act in 1938, the question of whether the production employees of producers of aggregates sold and used within the state were covered by that law has been unsettled.

Prior to 1945 all the official interpretations of the law held that they were not covered. In 1945 the Wage and Hour administrator changed his mind and reversed his interpretation so that they were regarded as covered. Almost immediately after its issuance the administrator's new interpretation was challenged in the courts.

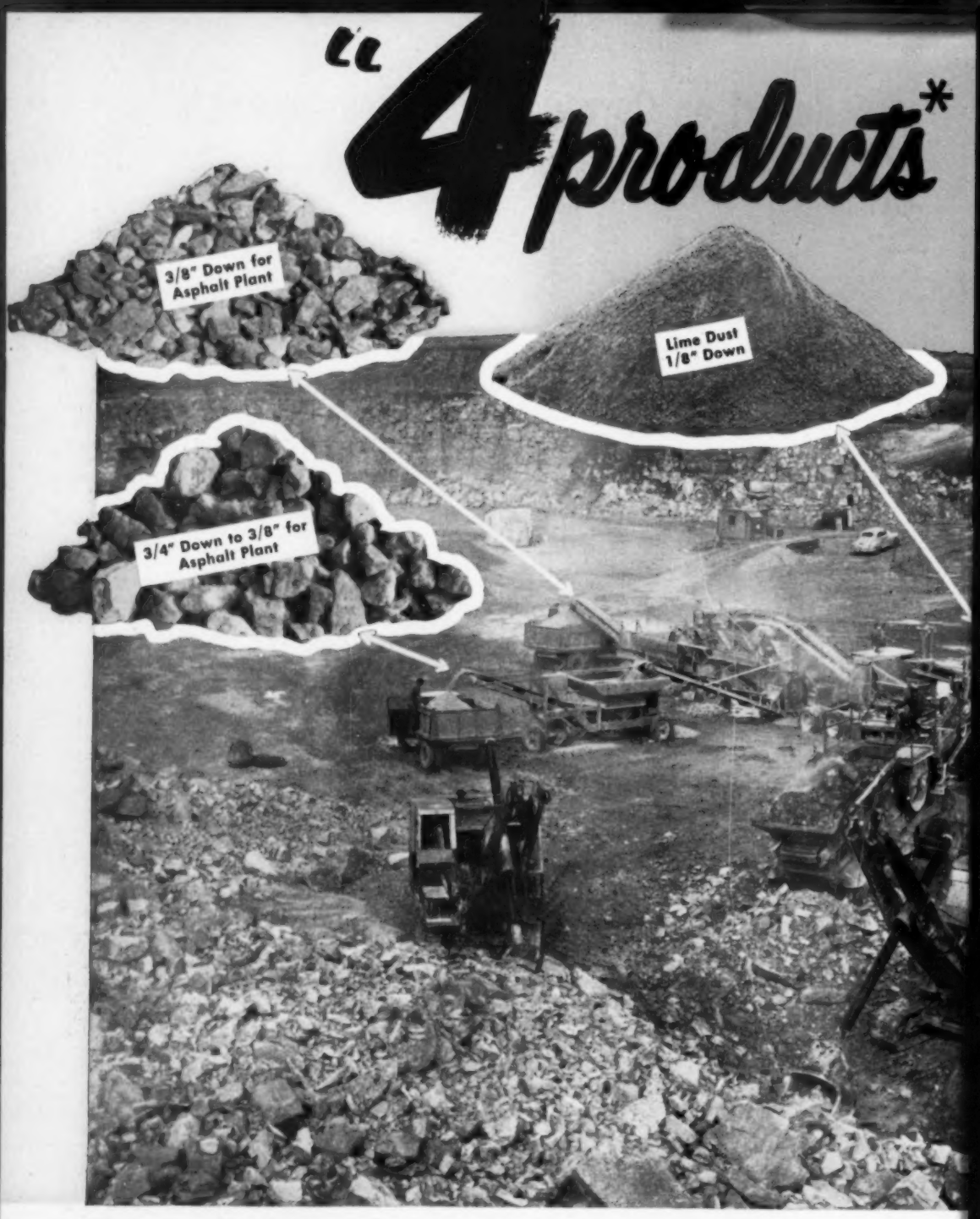
In the first of these cases decided, the Schroeder case, the Circuit Court ruled that even where the aggregates were used on instrumentalities of commerce, the employees producing the aggregates were not covered. The Supreme Court refused to review this decision and it appeared to be the law thereafter.

In 1952 several other cases were decided by various circuit courts, some of which came to the opposite conclusion. To straighten out the uncertainty, the Supreme Court agreed to consider two of them, the Alstate case and the Hempt case. In both of them, it ruled contrary to the Schroeder case and upheld the Wage and Hour administrator's interpretation.

As things now stand, therefore, this much is settled: employees of aggregates producers are covered by the Wage and Hour law if they produce materials which are to be used in the reconstruction, repair, maintenance, or improvement of instrumentalities of interstate commerce, such as railroads and highways. This would include the employees of most aggregates producers most of the time.

Such covered employees must be paid a minimum of 75 cents an hour and time and one-half their regular rate of pay for hours worked in excess of 40 hours weekly. In addition, the employer is required to keep very detailed payroll and other records. Since most aggregates producers conform with the minimum wage and overtime provisions in any event, the principal additional burden of the new ruling will be the record keeping involved. The records must be kept, however, or the employer is automatically in violation of the law.

Equipment, including aggregate-production and construction machinery, used in the building of Cachuma Dam near Santa Barbara, Calif., and Falcon Dam on the Rio Grande near Laredo, Tex., has been acquired by the Hawthorne-Michaels Company. The purchaser plans to dispose of the various items, in whole or in part, through its offices located in Los Angeles, San Francisco, and Chicago.



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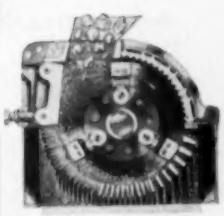

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HERE's a Cedarapids Unitized Plant which turns out 210 tons per hour of four different products for a large Midwestern producer! The heart of the plant is a Portable Hammermill Secondary (shown at the left directly under the pile of lime dust) where a 4033 Cedarapids Hammermill handles all the final reduction.

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When your job calls for aglime or crushed limestone, or both in one operation, be sure to investigate all the advantages of Cedarapids Hammermills. They are available in 4033, 3033 and 2033 sizes, as individual units, or in portable or stationary plants. Your Cedarapids distributor will gladly help you select the size best suited for your needs. Call him today.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

INDIANA MINERAL AGGREGATE GROUP HOLDS ANNUAL MEETING IN INDIANAPOLIS

THE Indiana Mineral Aggregates Association, Inc., held its annual meeting at the Claypool Hotel in Indianapolis on March 19-20. The well-attended meeting was featured by talks covering a variety of subjects of great interest to the group, including the Agricultural Conservation Program, blasting legislation, the Indiana Toll Road, the

By KENNETH A. GUTSCHICK

geology of the state's gravel deposits, and the durability of Indiana's gravels.

The meeting was opened with general remarks by Ralph E. Simpson, engineer-director of the association, and K. R. Misner, retiring president. Bruce Hardy, a farmer who is also affiliated with the Scott County Stone Company, Scottsburg, presented the first talk on the subject *Agricultural Conservation Program.* Mr. Hardy reported on two recent visits he made to Washington, D. C., on behalf of the association and the agricultural limestone industry. While in Washington he contacted Congressional members of the general appropriations committee and the special seven-man subcommittee on agriculture, as well as Department of Agriculture officials, particularly members of the P.M.A., for the purpose of helping to prevent the 1953 A.C.P. appropriation of $250,000,000 from being cut. The speaker expressed the belief that this appropriation would be cut only slightly, if at all. He urged that agstone producers and farmers write to their congressmen to request their support of the full A.C.P. appropriation.

Ralph E. Simpson, engineer-director of the I.M.A.A., addressing the group.

Jules E. Jenkins, Vibration Measurement Engineers, Inc., Chicago, presented a paper on *Blasting Legislation—Its Pitfalls and Benefits,* in which he discussed attempts by various states to enact blasting legislation. Early laws, he stated, dealt with such items as location of powder magazines and the like; now the trend is toward legislation dealing with vibration and noise effects.

According to Mr. Jenkins, Pennsylvania was one of the first states to enact blasting legislation, but that concerned strip mining of coal rather than quarrying. This law restricted vibrations to a certain maximum limit and restricted mudcapping to less than 10 lb. of dynamite. In addition, Primacord trunk lines were required to be covered if located less than 2,000 ft. from dwellings.

The most advanced blasting legislation was enacted in New Jersey on August 8, 1952, according to Mr. Jenkins. This law is based on the intensive, technological vibration studies made in recent years; it establishes allowable limits of ground motion and noise, which are based on both ground frequency and displacement. For example, allowable limits are as follows: frequency up to 10 cycles per second, maximum amplitude .030 in.; up to 20 cycles, .015 in.; up to 30 cycles, .010 in.; etc. The maximum allowable sound pressure from blasting beyond the quarry is not to exceed 100 decibels.

By using precise seismological data rather than man's psychological and physiological responses to blasting, this most recent law is a great step forward in the field of blasting legislation, the speaker concluded.

A highly technical engineering paper on *A Proposed Method to Evaluate Structural Properties of Paving Structures* was presented by W. M. Aldous, chief, soils and surfacing branch, C.A.A., Indianapolis. The paper dealt with a detailed load transmission test now being conducted at the C.A.A. experimental station in Indianapolis, which is being undertaken in order to develop a procedure applicable to solving practical paving design problems.

Bruce Short, secretary, Indiana Toll Road Commission, Indianapolis, gave a progress report on the proposed toll road to be constructed across northern Indiana, which will connect the Ohio turnpike (near

Members of the Indiana Geological Survey, Bloomington, attending the meeting were Haydn Murray; Charles F. Deiss, state geologist; and John B. Patton, head of the Industrial Minerals Section. Mr. Patton spoke on Indiana's gravel resources.

Clete Brooker, Newton County Stone Company, Kentland; John Criswell and Albert Berry, both of the Scott County Stone Company, Scottsburg; and Sam Omasta, assistant executive-secretary, National Agricultural Limestone Institute, Inc.

Angola) with a superhighway leading into Chicago (near Gary). He stated that this project will require an estimated 1,500,000 barrels of cement, 1,000,000 tons of sand, and 1,500,000 tons of coarse aggregate. Estimates of cost are expected to be completed this fall, and contracts will be let soon thereafter. Mr. Short expressed an optimistic view that initial construction would begin in the spring of 1954. However, these dates are tentative, based upon many remaining obstacles such as acquiring certain rights of way, finishing estimates of cost, and selling bond issues.

A preliminary report on the character of Indiana's sand and gravel deposits was given by John B. Patton, chief, Industrial Minerals Section, Indiana State Geological Survey, Bloomington. According to Mr. Patton, this body has recently completed an extensive sand-and-gravel survey of the state, in which more than 3,000 pits, including over 600 active pits, were mapped. Of that number, 90 localities were studied and sampled in detail, and complete sieve analyses and lithologic (rock-type) analyses were made. For the size gradation study, sieves having openings of 2 in., 1 in., ½ in., and No. 4 mesh were used. Approximately 20 major rock types were determined in the lithologic study.

Mr. Patton pointed out that Indiana's sand and gravel deposits are a product of continental glaciation and can best be studied if their relationship to glacial geology is used as a basis for interpreting the field and laboratory data. He stated that the deposits are localized primarily along glacial sluiceways (glacial melt water valleys) extending considerable distances beyond the ice front and also in outwash plains formed at the ice front. In addition, very localized deposits were formed beneath the glacier itself.

Among the major findings of the study were the following: in the sluiceways the particle size decreases steadily in the downstream direction; the percentage of soft materials generally decreases downstream, while the percentage of hard, resistant materials increases—thus, hard rock types like chert would tend to be relatively more abundant downstream; the lithologic character of the deposit to a large degree reflects changes in bedrock over which the ice passed immediately before dropping its load.

In conclusion, the speaker pointed out that Indiana's sand and gravel producers operate in deposits that vary considerably as to size gradation and lithologic character; yet the aggregates must meet the same specifications. As a result, he stated that some producers have decided advantage over others because of the favorable character of the deposit.

D. W. Lewis, research engineer, Joint Highway Research Project, Purdue University, who spoke on the durability characteristics of Indiana gravels.

D. W. Lewis, research engineer, Joint Highway Research Project, Purdue University, presented a paper on *Durability Characteristics of Indiana Gravels as Concrete Aggregates.* He stated that the Joint Highway Research Project has made extensive investigations of concrete pavement durability, in which over 2,600 miles of pavement built prior to 1935 were studied. Early studies resulted in the following conclusions:

1. The principal cause of blow-ups and D-line pavement deterioration in Indiana is the action of freezing and thawing on concrete containing highly saturated and non-durable coarse aggregate.

2. Freezing and thawing tests on concrete beams containing vacuum-saturated aggregates correlate with field performance.

3. Indiana fine aggregates appear to have no significant effect on the durability of concrete pavements.

Mr. Lewis stated that recent studies of the gravel coarse aggregates have been concerned chiefly with efforts to identify the deleterious constituents present and to separate them from the other rock types for testing to determine their physical characteristics. The separations were made through use of heavy-media liquids. Conclusions resulting from these investigations were as follows:

1. Sandstone and chert are the principal deleterious constituents. Others include shale, ocher, and badly weathered igneous, metamorphic, and carbonate rocks (limestone).

2. Heavy-liquid separation techniques provide a convenient means for separating the non-durable from the durable particles.

3. The deleterious constituents are characterized by low specific gravity, high absorption and degree of saturation, and consequent lack of durability in freezing and thawing.

4. The percentages of low-specific-gravity particles in the gravels are correlated with the field performance records of the sources.

The concluding speech was given by Albert J. Wedeking, chairman, Indiana State Highway Commission, who emphasized that a highway department cannot function efficiently without the co-operation of the other members of the highway industry, namely the aggregate producers, the contractors, and the equipment manufacturers and dealers. He also stated that the roads of the future must be of better design in order to meet the increasing traffic and heavier loads to which they are being subjected.

At the business meeting held on Friday morning the following officers were elected for 1953: president, C. W. Siniff, American Aggregates Corporation, Indianapolis; vice-president, G. W. Bowen, Hy-Rock Products Company, Marengo; secretary-treasurer, M. G. Johnson, The Merom Gravel Co., Indianapolis; and engineer-director (re-elected), Ralph E. Simpson, Indianapolis.

The following directors were named: E. P. Holwadel, Ohio Gravel Company, Cincinnati; Robert Connelly, Terre Haute Gravel Co., Terre Haute; W. Stonestreet, Stonestreet Gravel Company, Angola; R. A. Wilson, Connersville Gravel Co., Connersville; George Wheeler, Kirkpatrick Gravel Company, Cambridge City; C. A. Broecker, Newton County Stone Company, Kentland; Claude Monce, Meshberger Bros. Stone Corporation, Linn Grove; R. E. Ward, The Francesville Stone Co., Francesville; N. E. Kelb, St. Paul Quarries, Inc., Indianapolis; Max Radcliff, Radcliff & Berry, Inc., Orleans; and R. L. Paulus, W. C. Babcock Construction Co., Inc., Rensselaer.

At the annual banquet Marshall B. Abrams, managing director, Construction League of Indianapolis, gave an inspiring talk on *Construction—A Wealth-Creating Industry.* S. C. Hadden, former executive-secretary of the I.M.A.A. and also former Indiana State Highway Commissioner, was a special guest at the banquet; he was presented a special award.

New Specifications, Tests, and Research Discussed at A.S.T.M. Committee Week

MUCH new research work was discussed, and many new specifications and tests for materials and numerous revisions were completed at the 300 meetings of technical groups during A.S.T.M. Committee Week in Detroit, from March 2 to 6, 1953. A large number of meetings are concentrated during this week so that the committee members — leading technical men concerned with specifications and tests—can attend the various sessions with considerable saving of time and expense.

Most of the new and revised standards completed at the meeting are subject to letter ballot in the committees before they are referred to the parent society for action. In general, the new specifications will be considered finally at the A.S.T.M. annual meeting in Atlantic City during the week of June 29, although some may be approved prior to that meeting through the Administrative Committee on Standards.

Committee C-1 On Cement The development of a specification for slag cement was authorized at the meeting of Committee C-1 on Cement, of which R. R. Litehiser is chairman. The Subcommittee on Properties of Slag Cement, after investigation and study, recognized the desirability and need for such a specification. In addition, considerable attention was given to the existing specifications covering portland, blended, and masonry cements.

After several years as a tentative, the Specification for Air-Entraining Portland Cement, C 175 T, was recommended for advancement to standard. Several changes were recommended in the Standard Specifications for Portland Cement (C 150), including a change in the maximum air content from 15 to 12 percent, a replacement of the present SO_3 requirement by a leach test, and the advancement to standard of the tentative revision pertaining to fineness requirements. The Sponsoring Committee on Masonry Cement reaffirmed its previous action, recommending an autoclave test requirement in specifications C 91, with the maximum limit of 1 percent expansion at seven days. The intention to write a specification for pozzolanic cements was reaffirmed by the Sponsoring Committee on Blended Cement, with a questionnaire to be circulated to cover conflicting points.

The use of mechanical mixing apparatus was discussed by several of the working committees, indicating a general trend toward the adoption of mechanical mixing in place of hand mixing where it is required in the various test methods. The Coordinating Committee on Tests proposed a tentative method for mechanical mixing of hydraulic-cement mortars of plastic consistency, which was accepted for committee letter ballot. Two proposed test methods on strength, namely, flexural and compressive strength, as published for information in the December issue of the A.S.T.M. *Bulletin*, will be reviewed through a co-operative series of tests to study the effect of mechanical mixing, as compared with hand mixing. Eight laboratories will participate, using 24 cements, based on Types I, II, and V. The use of the mechanical mixer is also under way in a co-operative series, not yet completed, on a proposed bleeding test. The round-robin test series to establish the resistance of the sulphate resistance test has been completed, and the results were discussed.

A revision is contemplated in the method for determining and analyzing Darex in C 114 T, involving a simplification of apparatus and stricter precautions against nitrogen contamination. Investigation is continuing on the suitability of various types of flame photometers for use in testing cement.

Committee C-7 On Lime At a meeting of Committee C-7 on Lime, of which J. A. Murray is chairman, it was stated that closer co-ordination was felt desirable between Committee C-7 and Committee C-12 on Masonry Mortar in proving the new Tentative Specifications for Mortar for Unit Masonry (C 270 T) in respect to the reference and classification of lime mortars. A joint meeting of the Structural Lime Subcommittee of Committee C-7 and the Mortar Specifications Subcommittee of Committee C-12 is being planned during the 1953 annual meeting in Atlantic City to discuss this matter.

A new proposed method for determining the settling rate of lime was accepted for committee letter ballot. Six laboratories will participate in a round-robin testing program to evaluate the different available CaO methods. Another series of round-robin tests, with eight laboratories participating, will compare two autoclave methods, one using a gypsum admixture and the other a portland cement admixture. A reactivity method will be reviewed by a subcommittee. A new subcommittee was authorized to prepare specifications on lime for soil stabilization.

Committee C-9 On Concrete and Concrete Aggregates Proposed specifications for fly ash and for lightweight aggregates in concrete were focal points of interest during the meetings of Committee C-9 on Concrete and Concrete Aggregates. The development of these standards have been under way for a considerable time and represent many hours of discussion and study on the part of the respective subcommittees. The Subcommittee on Admixtures recommended the acceptance for committee letter ballot of a proposed test method for fly ash as an admixture to portland cement. A proposed specification is being referred back to the subcommittee for further study.

The Subcommittee on Lightweight Aggregates reported that considerable progress had been made toward the development of a complete revision of the existing Specifications for Lightweight Aggregate (C 130). The subcommittee reviewed drafts for three separate specifications, covering lightweight aggregate for insulating concrete, structural concrete, and concrete masonry units. It is now expected that definite recommendations for the acceptance of these proposed specifications will be made to Committee C-9 at its next meeting during the 1953 A.S.T.M. annual meeting.

A new Tentative Specification for Liquid Membrane-Forming Compounds for Curing Concrete was accepted for letter ballot of the committee. An additional grading was recommended for immediate adoption for inclusion in those now listed in the Standard Method of Test for

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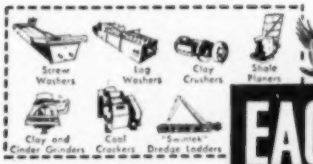
Eagle Plant at American Sand Co., Turner, Kansas, makes variety of desired sand blends!

"Seasoned to taste" is the way American Sand Co. turns out sand. Their Eagle Washing, Classifying and Dehydrating Plant scalps off excess water, classifies the sand into various meshes, then blends the sand back together to produce the specification material desired. Hydraulic classification takes place in the Eagle Water Scalping Tank — coarser mesh settling at the feed-in end — finer mesh at the water overflow end and the intermediate meshes in-between. Through adjustable bleeder valves the separated sand flows to a divided collecting-blending flume. Splitters can be adjusted to feed any blend, to either of the Eagle Screw Units for final washing, classifying and dehydrating.

Eagle Equipment—"the last word" in washing and classifying—based upon nearly half a century of experience—can modernize your plant—quickly returning its cost—whether pumping operation like American Sand or dry pit . . . Let a qualified Eagle distributor give you the facts . . . Ask for Catalog 47.



LEADERS IN AGGREGATE WASHING AND CLASSIFYING EQUIPMENT FOR HALF A CENTURY

133 HOLCOMB AVE.
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EAGLE IRON WORKS

Abrasion of Graded Coarse Aggregate by Use of the Deval Machine (D 289). This grading is similar to one recently adopted by the American Association of State Highway Officials.

Proposed methods, authorized for publication for information only, include a pulse velocity method of dynamic testing of concrete and a method of test for thermal coefficient of aggregates.

Much progress was reported in the various subcommittees in the development of data for standardization purposes. This activity includes the examination of cement paste in concrete for air and water voids; the effect of mineral aggregates with respect to bonding; pore spaces in aggregate; a test for volume change of concrete products; the use of SR-4 strain gauges for coarse aggregate in measuring volume change; limitations on alkali activity in the present specification for concrete aggregates (C 33); and a co-operative series for evaluating proposed abrasion test methods. A variety of methods, 17 in all, are being reviewed for the purpose of developing a standard method of testing a set time of concrete. This activity will be co-ordinated with Committee C-1 on Cement.

An innovation in the meeting program of the committee was introduced at this meeting in the form of a presentation of several short papers. Four such papers were presented at the close of the business meeting and were very well received. The papers were essentially in the nature of reports from certain subcommittees. The subjects and authors are noted as follows: *Definition and Methods of Testing Setting Time of Concrete*, by E. W. Scripture Jr.; *Methods of Testing Reactivity of Concrete Aggregate*, by R. C. Mielenz; *Tests of Truck Mixers*, by Stanton Walker; and *Investigation of the Sulphate Soundness Test of Concrete Aggregate*, by D. O. Woolf.

Committee C-12 On Mortars For Unit Masonry

The use of a ceramic wick method to determine the relative efflorescence tendencies of mortars shows promise as a possible standard test method, it was reported at the meeting of Committee C-12. A proposed test procedure will be circulated to the entire committee with accompanying data. In considering the specifications for mortar, suggested changes submitted from Committee C-7 on Lime will be studied. Attention will also be given to a request for a survey of the lime industry to establish the availability of Type S lime throughout the country. Differences between A.S.T.M. specifications in sand used in plaster (C 35) and aggregate for masonry mortar (C 144) were discussed with the results of a survey showing that most sands do not conform to Specification C 144. A study will be made of these differences.

A subcommittee is engaged in preparing a preliminary draft of a specification for pointing mortars. Also, the effect of mortar expansion on flat slab construction is being studied, using 8-ft. high piers and cements varying in autoclave expansion from 0.5 to 8 percent.

Anti-Friction Bearings

(*From page* 156.)

small pockets. They can easily be distinguished from ball dents, especially if the race is examined with a magnifying glass, as the polishing lines in the race have been worn away at each pocket. On the other hand, ball dents depress the surface (deform it), and the polishing lines will continue on through these depressions.

A common claim on the part of a customer is that a bearing has a flat ball. When such bearings are examined, it is found that the noisy condition which the customer thought was caused by a flat ball is due to something entirely different. It is extremely rare that defects in material or hardening are the cause of early bearing failure or noisy bearings. Another common complaint is a cracked inner race of small bearings. In most instances, it will be found that the shaft is oversize and the inner race was expanded excessively. It is possible that the inner race may have been forced on the shaft while it was in a cocked position. Fig. 13 shows another example of abuse—this time with a hammer.

Bearings, though in common use every day, are precision units. They must be treated with common sense care if they are to perform as expected.

Uses Own Aggregates

(*From page* 152.)

2-deck sizing screen. This screen is usually equipped with 1-in. and ½-in. wire cloth on its top and bottom decks, respectively. The sizes off these two decks are chuted into two of the five 45-cu. yd. Butler steel bins. The material through the bottom deck drops onto a second 5- by 12-ft., 2-deck screen with ½- and ⅛-in. openings. The three sizes from this screen go to the three remaining bins.

Provisions are made for recrushing any of the three coarse sizes. An 18-in. by 37-ft. inclined conveyor between two of the coarse stone bins can draw from them direct and can also be fed direct from a chute at the screen discharge spout for a third size. A split chute makes it possible to feed from the reclaiming conveyor to either or both of the two 36-in. Telsmith Gyrasphere reduction crushers. An 18-in. by 78-ft. return belt conveyor carries this material back to the main conveyor to the sizing screens.

Delivery trucks are loaded under the bins through lever-operated clamshell gates. All shipments are weighed on a Howe truck scale at the plant office. Some stockpiling of finished sizes is done, and a Barber-Greene loader is used to load them into trucks for delivery.

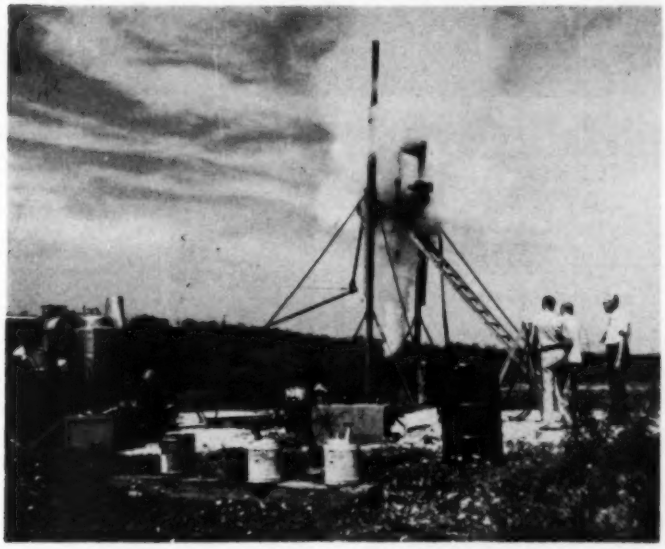
This operation is entirely self-sufficient as to power. The quarry and hauling equipment is all diesel or gasoline-engine powered. The large plant equipment is driven by four diesel engines, and smaller units are driven by individual Ideal electric motors using power from a diesel generator set. The primary crusher and its apron feeder are driven by a Caterpillar D364 V8 diesel engine, the secondary crusher by a D1700 engine, and each of the two reduction crushers by Caterpillar D13000 diesel engines. Another D364 V8 engine drives a General Electric generator which provides 220v. power for the motors driving the screens, the conveyors, and the tunnel feeder.

It has been stated that this plant was designed by the Smith Engineering Works, which also supplied the feeders, crushers, and screens. Barber-Greene belt conveyors and steel trusses are used throughout. Harristeel screen cloth is used exclusively.

Thomas Fitzgerald is president of the Fitzgerald Bros. Construction Co. Edmund Fitzgerald is vice-president and treasurer and is in general charge of all operations. He was also responsible for some of the original features in the plant design. William Dunn, superintendent of the crushed stone plant, was in charge of its construction.

Proposals have been made in the North Dakota Legislature to establish a state cement plant, a project pronounced feasible by the North Dakota Research Foundation. Such an undertaking would call for a $5,000,000 bond issue.

High Drilling Rates Reported For Steam-Powered Percussion Drill



A new steam-powered percussion drill, which is claimed to be applicable to drilling blast holes, oil wells, and water wells, has recently been invented by Ross Bassinger, Bassinger Tool Corporation, San Antonio, Tex. Called the Bassinger Percussion Drill, the new drill is similar to a small-scale double-action pile-driver.

Developed over a period of 5½ years, the drill was recently tested at the Institute of Inventive Research near San Antonio. During the test, a 4½-in. hole was drilled through a 32-in. block of hard granite in 3 min. 35 sec., which is an approximate rate of 45 ft. per hr. Since this rate of drilling in granite is almost three times faster than with most conventional methods the equipment should evoke considerable interest in the quarrying industry throughout the country.

● In demonstration tests the steam-powered percussion drill shown here drills a 4½-in. hole in granite at rates up to 45 ft. per hour. The steam generator is at the far left, and the control panel is at the right.

The Bassinger drill is a small device about 5 ft. long and less than 4 in. in diameter, including its two pistons and cylinders. It is powered by 400-lb. steam pressure, supplied by a portable Vapor-Clarkson steam generator.

The drill is designed to beat on solid head bits, rather than rotary bits, because the impact is severe enough to break the teeth on rotary bits. The bit heads which are equipped with four tungsten carbide inserts, are made in various sizes from 4½ to 12 in. in diameter.

Exhaust steam from the hammer piston is ejected out one center hole at the bottom of the drill between the tungsten carbide inserts and effectively carries away the chips and grindings.

Tests proved that it requires 400 lb. steam pressure to operate the drill effectively at a maximum rate of 3,000 4-in. strokes per minute. One estimate indicates that this pressure resulted in 256,000 lb. of impact per blow.

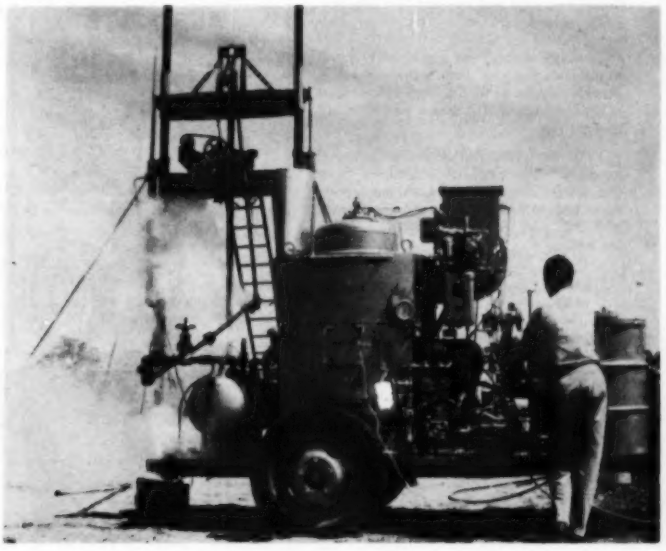
The portable steam generator, which burns fuel oil, has automatic modulating controls; it develops 75- to 600-lb. steam pressure and produces 1,000 to 3,000 lb. of steam per hour. Tests indicated that it requires about 2,400 lb. of steam an hour at a sustained 400-lb. pressure to operate the 4½- in. drill.

During the test, the full 400-lb. working steam pressure was developed from cold water in about 3 minutes by the Vapor-Clarkson steam generator. The steam was lubricated by a Texsteam Injector pump, which forced about one quart of lubricant per hour into the steam. A high-pressure steam reservoir was mounted on the trailer to smooth out hammer operation.

Two air-cooled gasoline engines were used in this drill testing setup. One was used to set up hydraulic power to lift the drill up and down. The second engine, by a gearing down arrangement, turned the drill in a horizontal plane

● Right: A closeup of the portable steam generator which provides 2,400 lb. of steam per hour at 400 lb. pressure to drive the percussion drill. The unit is fired with No. 2 fuel oil. Note the drilling rig in the background.

● Below: Ross Bassinger, inventor of the drill, holding one of the bits. Cutting edges are tungsten-carbide inserts. The steam ejected through the hole in the end of the bit carries away chips and dust.



during the hammering. Because the hydraulic as well as the steam controls were operated from a panel located near the drilling rig, the operator was able to have quick and accurate drill control of the speed of impact by varying the steam output.

During the tests compressed air was also tried, but it was found to be uneconomical for this job, since it would require a very large stationary compressor to provide the pressures and volume required.

The Bassinger drill, the guides, the rotating equipment and the steam generator are said to be very light, making the entire unit portable. Additional tests are now being conducted in a commercial quarry in the southern part of Texas.

personal mention

LATHROP SMITH has been appointed sales manager of lightweight slag aggregate for the Economy Fuel & Supply Corporation, Buffalo, N. Y., an associate company of the Donner-Hanna Coke Corporation. Mr. Smith was formerly in the Donner-Hanna sales department.

H. C. Lee

HARLEY C. LEE has been elected a director of Basic Refractories Incorporated of Cleveland, Ohio.

Mr. Lee holds a Bachelor of Mining Engineering degree from Ohio State University. He joined Basic Refractories in 1926 and has been a vice-president of the company since 1945. During World War II he was in charge of the technical department of Basic Magnesium Incorporated, a subsidiary of Basic Refractories at Henderson, Nev. For ten years prior to this position he was director of research for Basic Refractories. Mr. Lee is a member of the American Institute of Mining and Metallurgical Engineering, American Society of Metals, American Ceramic Society, American Minerological Society, and the Geological Society of America.

ROBERT A. MURRAY was recently promoted to the post of foreman, Mine Surface Production and Maintenance at the Warner Company's Bellefonte plant. He succeeds Harry Hazel, who has retired. Mr. Murray has been at Bellefonte since 1928.

SAMUEL B. JOHNSON has assumed the duties of safety engineer for the Warner Company plants in the Morrisville area, including the Van Sciver plant, the Morrisville yard, the terminal plant, the dredge *Franklin*, and the slag division. He will be responsible for the co-ordination of safety plans at these locations and will also carry out the safety program of the industrial Relations department.

JAMES T. MAHER has been appointed assistant sales manager of New York sales territory, and W. M. TOMLINSON has been named assistant sales manager at Kansas City, Mo., for the Universal Atlas Cement Company, a U. S. Steel subsidiary.

Mr. Maher started work in the New York office of U. S. Steel in 1922 as stenographer to the comptroller. Five years later he joined Universal Atlas and was transferred in 1934 to the sales department. Through a succession of assignments, he rose to chief clerk in 1944, a post in which he has served until his recent promotion.

Mr. Tomlinson joined Universal Atlas at Kansas City in 1928 as a sales representative and has served in that capacity until his new appointment.

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FORT WORTH QD SHEAVE

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The Fort Worth "QD" Sheave with interchangeable hub is easily and quickly installed and removed. You get a positive press fit all the way around the shaft eliminating wobble and eccentricity found in old style sheaves. Here's the job tested, precision-engineered hub and sheave that is used throughout industry for transmitting power.

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Catalog explaining additional advantages and construction details will be furnished on request.

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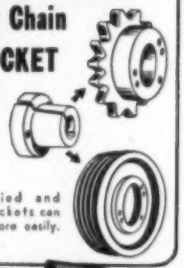

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GREATER UNIFORMITY of PERFORMANCE IS ASSURED with NOPCO ERTRANE* C

Every batch of Nopco* Ertrane C – the *most economical* air-entraining agent on the market – is carefully tested to assure uniformity of performance when this agent is added to portland cement. ASTM methods for determining entrained air and water retention properties are standard control tests for all production.

We are not content with having produced an outstanding additive which fully satisfies all the requirements of ASTM Specification C226-50T; we see to it that every pound of Ertrane C is "right up to the mark". Thus you can use Ertrane C with confidence, certain that the standard of quality is maintained without variation from bag to bag.

This specifically formulated air-entraining agent imparts *excellent durability* to concrete, plus plasticity (through air formation), water repellency, and desirable qualities that increase workability.

Ertrane C saves time and labor. It is only necessary to add this agent to water and stir (no additional chemicals are required). Feed systems remain clean when it is used, eliminating necessity for purging.

Profit by putting Nopco Ertrane C to work for you. We'll gladly supply full details and informative booklet upon request.

Samples of Ertrane C production are constantly checked in Nopco's laboratories in accordance with standard ASTM procedure – to guarantee maintenance of specified standard of quality, and uniformity.

Ertrane C can also be used to advantage in masonry cement.

Added to masonry cement, Ertrane C imparts a smooth, buttery texture – promotes easy spreading which greatly facilitates troweling.

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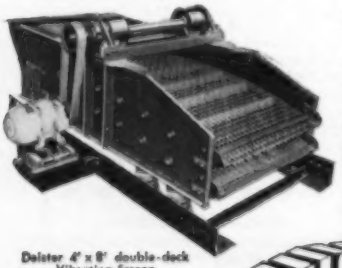
...including 300 tons ag-lime without blinding!

Performance facts, worth reading twice... from J & K Stone Company's 100% Deister-equipped plant at Muncie, Ind. Partner-owners Kenneth K. and F. W. (Jake) Irving are using *14 Deister Screens* at present—five at Muncie, the others at their quarry near Eaton, Ind., and the J & K gravel pit north of Muncie on Highway 3.

"High-speed performance—easy cloth-changing—and *no breakdowns* are why we've standardized on Deister Screens", says Kenneth Irving; "and after 28 years of using Deisters, we ought to know! Of the five Deisters in our Muncie operation—ranging from 1 to 8 years old—none has given any trouble. We're getting 40% ag-lime—without blinding. That's why there's a *sixth* Deister going in here—right away!"

The Deister performance facts from J & K are part of a long list from the Deister customer files—including many operations with problems similar to yours. Write now for specific information on how Deister Vibrating Screens can step up your production, reduce maintenance costs—and produce *better* sizing, *cheaper!*



Deister 4' x 8' double-deck Vibrating Screen

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DEISTER MACHINE COMPANY
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O. C. Hasse

Otto C. Hasse, a veteran employee of the Monarch Cement Company, Humboldt, Kans., retired from his duties on February 17 of this year. He entered the field of cement manufacturing in 1904 at the old Crescent Company plant at Wampum, Pa., after being graduated from the Case Institute of Technology at Cleveland, Ohio. After serving there as chief chemist for 17 years he accepted the position of superintendent of the Bessemer Limestone and Cement Company at Bessemer, Pa.

On July 15, 1925, he took charge of the laboratory of the Monarch Cement Company at Humboldt, a post which he held until his recent retirement.

Patrick H. Ryan has been appointed sales manager, Asbestos Products Division, and William U. Townsend as commodity manager of the Asbestos Products Division, for the National Gypsum Company. This new department was formed after National Gypsum's recent purchase of the Asbestone Corporation of New Orleans and Smith Asbestos Products, Inc., in Millington, N. J.

Formerly manager of the St. Louis Division of the Asbestone Corporation, Mr. Ryan also has served as vice-president in charge of sales at Smith Asbestos. Mr. Townsend has been associated with National Gypsum for 15 years, first as assistant manager in the Industrial Sales Division and then as export manager.

George W. Garrett was named general manager and executive vice-president of the Stewart Sand and Material Company, Kansas City, Mo. He formerly was secretary and vice-president. The firm operates concrete plants in six cities in addition to its sand and crushed stone plants and building materials yards in Greater Kansas City.

Christian F. Beukema of U. S. Steel Company's Raw Materials Division has been named general manager of operations of the Michigan Limestone Division, U. S. Steel Corporation.

Edward G. Thoenes has been named to the development department of Monsanto Chemical Company's Phosphate Division. Mr. Thoenes has been assistant chief chemical engineer of the Phosphate Division since May, 1952, and division project engineer for Monsanto's elemental phosphorus plant at Soda Springs, Idaho. He joined Monsanto in 1941.

Mr. Thoenes has served in the Phosphate Division's engineering department since 1946, after three years in the U. S. Navy. He served as project engineer for the sixth phosphorus furnace at Monsanto, Tenn., and was construction superintendent on the expansion of the division's Carondelet, Mo., plant.

R. B. FULLER, who is presently manager of the Florida Phosphate Department of the International Minerals & Chemical Corporation, will be promoted to the position of assistant to the vice-president in charge of the Phosphate Division, effective July 1, 1953, Mr. Fuller will work on special assignments and will be directly responsible to George W. Moyers, vice-president in charge of the division, according to Louis Ware, company president.

At the same time it was announced that, effective July 1, 1953, F. B. BOWEN, who is manager of the Tennessee Phosphate Department, will become manager of the Florida Phosphate Department and will assume the responsibilities relinquished by Mr. Fuller. Mr. Bowen will be specifically responsible for all of the activities of this department, which include rock and chemical phosphates.

Mr. Fuller has been with International for the last 27 years, starting in Florida in February, 1926, as general superintendent of the Rock Department. After one year as general superintendent he became manager of the Florida Rock Department.

Mr. Bowen joined the Florida Phosphate Department staff in January, 1926. From that date through June, 1943, he had experience in mining, beneficiating, and handling of phosphate rock in all of its phases. His last position in Florida was that of mining superintendent. On July 1, 1943, he was promoted to manager of the Tennessee Phosphate Department.

C. LESTER RICHARDS will succeed Mr. Bowen as manager of the Tennessee Phosphate Department. Mr. Richards is a graduate of the Columbia School of Mines and was previously associated with the Anaconda Copper Mining Company and the Reynolds Mining Corporation. Since coming to International he has served as mining engineer and, since May, 19446, as assistant manager of the Tennessee Phosphate Department.

The appointment of FRANCIS V. DUPONT as commissioner of the Bureau of Public Roads was announced recently by Lt. General Eugene Reybold, executive vice-president of the Association of American Road Builders' Association. Mr. DuPont succeeds Thomas H. McDonald, who has held this post since 1919.

LINDA CARLSON, 9-year-old daughter of BROR CARLSON, assistant comptroller of International Minerals and Chemical Corporation at Chicago, recently won the Midget Girls' Championship in the annual *Chicago Tribune* Silver Skates Contest. Two of the other Carlson children, all boys, also took prizes.

National Gypsum Company officials have announced the appointment of JAMES D. ELGIN to the position of director of advertising and sales promotion. Mr. Elgin was formerly assistant to the vice-president of the Pabst Sales Company in Chicago and advertising and sales promotion manager for Toastmaster Products in Elgin, Ill.

Does the wire rope you use earn this kind of TRUST?
Typical of many, one master mechanic says, "We *always* use Hercules Red-Strand wire rope, because we know we can trust it for long life and safe service . . . every time." An inspector reports, "On a work test, we really abused Leschen rope. It more than satisfied our requirements."
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Why is that so? Simply because *higher-than-rated quality* in Red-Strand wire rope means *greater-than-expected* safety and performance.
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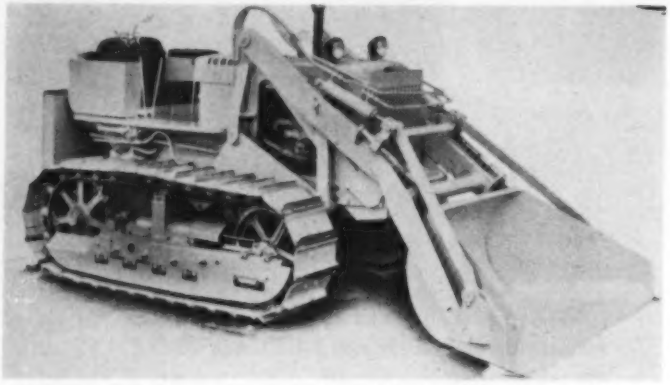


• Digging-Loader

A loader designed for digging and dozing operations has been added to the line of the American Tractor Company, Churubusco, Ind.

The "Terraload'r" can be used to load trucks and cars. It can be used for digging operations, and with the blade pivoted at the cutting edge it can bulldoze without roll-under.

There are three models of the Terraload'r, the GT-30 with a ½ cu. yd. bucket, and the GT-34 and DT-34 which have ⅝ cu. yd. buckets. The DT-34 is a diesel powered model. All models have steel track shoes with rubber or flat steel shoes available for street use.

• High-Speed Scrapers

Two new models of self-propelled scrapers that feature high-speed diesel operation have been announced by the Wooldridge Manufacturing Company, Sunnyvale, Calif.

The new models of the "Terra-Cobra" scrapers are the TH-B90 with a heaped capacity of 11 cu. yds. and the TH-B110 with a heaped capacity of 13 cu. yds. Both machines incorporate the basic features of the larger machines in the line including: positive hydraulic steering; air operated power control; "boiling bowl" loading; positive roll-out ejector; and heavy duty construction with many interchangeable components.

The Model TH-B90 has a 150 hp. Cummins Diesel engine while the TH-B110 has a 180 hp. Cummins diesel engine. Extremely high ground clearance, short turning radius, and ample flotation and traction are additional features of these models.

• Build-Up Electrodes

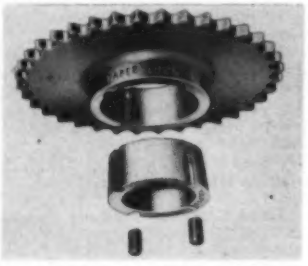
Electrodes especially designed for build-up use on carbon and alloy steels to provide a base for a hard-facing overlay has been brought out by the Stoody Company, Whittier, Calif.

Stoody Build-Up is an extruded alloy-coated rod that produces an alloy steel deposit of 29-31 Rockwell C under normal conditions. It is not a hard-facing alloy but has a limited usefulness as a final overlay where impact is the principal wear factor, as in shafting, gears and tractor rails. The purpose of the electrode is to give high tensile strength, toughness, and resistance to cold flowing.

• Taper-Held Sprockets

A line of "Taper-Lock" sprockets and roller chain has been developed by the Dodge Manufacturing Company, Mishawaka, Ind.

The sprockets use the same Taper-Lock principle of mounting that has been used on pulleys, and sheaves. This consists of a tapered bushing that it keyed to the shaft. The hub of the



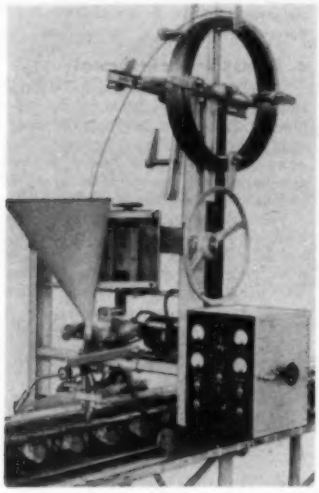
sprocket fits over it and is fastened by set screws so that tightening the screws causes the bushing to grip the shaft. The taper between the hub and bushing exerts as much pressure as a shrunk-on fit and permits easy removal and reuse. Boring of the sprocket to fit or the shaft is unnecessary as the bushing will accommodate variations in the shaft. The sprockets are made to fit American Standard chain.

The company states that distributors will carry a full range of sprockets in 40 to 100 pitch B-type.

• Automatic Welder

The "Reaxarc Automatic Welder and Positioner" has been added to the line of the Sight Feed Generator Company, West Alexandria, Ohio.

The Reaxarc Automatic Welder is designed to perform a large number of welding operations in fabricating and repair applications. Among the features of



the machine are: low and high voltage welding; high frequency starting and stabilization; control over low arc voltage and amperage; lineal or cross-bead welding; and a removable head.

Shafts, rollers, sheaves, and other circular surfaces may be easily welded as the rotating spindle can be adjusted vertically to accommodate a wide range of sizes. Angular positioning for welding idler and roller flanges and similar items is accomplished by a hydraulically controlled elevating device.

• Expandable Conveyor

A conveyor that can be expanded or shortened and adjusted in height has been bought by the A. B. Farquhar Division, The Oliver Corporation, York, Pa.

The conveyor is made in two sizes. One is 11 ft. long expanding to 18 ft., and the other is 15 ft. expanding to 25

ft. Height is adjusted on the legs so that the conveyor can be used at many angles. It is claimed that the versatility of the "Expand-O-Veyor" and its mobility makes it suitable for many handling problems where the conveyor needs to be moved as in loading and warehousing operations.

Athey SIDE DUMP TRAILERS

CHOSEN BY LARGE CEMENT PLANT

• The Marquette Cement Manufacturing Company have standardized on Athey PD-20 Side Dump Rock Trailers teamed with Caterpillar DW20 Tractors for hauling overburden at their big Oglesby, Ill. plant. These husky units haul heavy 4000-lb. per yard material, a mixture of shale and dirt, at high speeds. Furthermore, they know they can count on these rugged units to work year around, often 16 hours per day.

• On this typical overburden hauling job, the Side Dump Athey PD-20's save backing and separate hoisting operations by dumping on the fly over the edge of the fill, while the DW-20 — PD20 unit is still rolling forward safely at 8 m.p.h. The units average 250 tons hauled per hour or about 125 pay yards. The 3-1/2 yard shovel loads the trailer in 2.5 minutes. Then, the Cat DW20 pulls the loaded Athey PD-20 Trailer 3300 feet at an average speed of 10.3 m.p.h. including 800 feet of 8% adverse grade in 2.5 minutes. The "on-the-fly" dump takes less than half a minute; return of 2100 feet — with 350 feet of 15% down hill grade — requires 1.5 minutes for an average speed of 16 m.p.h.

• Athey PD-20 - Cat DW20 owners everywhere like this rugged high speed hauling. They are fast, with haul speeds up to 26.6 m.p.h., and have positive and safe air brakes on tractor and trailer. Positive six-wheel suspension makes fast, safe dumping without stopping at the edge of fill. The Athey PD-20 Trailer is designed to stand up on the toughest rock jobs. The high-tensile steel, all welded body presents a big loading target and is rugged enough to take lip loading of large rocks. The 29-cubic yard, 30-ton capacity makes an economical unit where big production is needed.

Athey PRODUCTS CORPORATION
5631 WEST 65th STREET • CHICAGO 38, ILLINOIS

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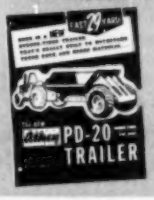


IT'S FREE!

ATHEY PRODUCTS CORPORATION
Dept. PQ-5 5631 West 65th Street, Chicago 38, Illinois
Gentlemen: I would like this additional information:
☐ Send me booklet. ☐ Show me movie.
☐ Show me PD-20 in operation.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

• Track-Type Shovel

A track-type shovel of 2 cu. yd. capacity has been announced by the Caterpillar Tractor Company, Peoria 8, Ill.

The new shovel is powered by a crawler tractor on a non-oscillating track frame. It is an integral unit with the shovel frame bolted and welded on the tractor engine support channels and the transmission housing. The hydraulic system is rear mounted.

The lift cylinders are mounted horizontally above the tracks and give a maximum height to the bucket of 10 ft. 9 in. with a reach of 3 ft. 5 in. The lift arms are of welded box construction and the bucket control arms are solid steel with box-type cross brace. The tractor has five forward and four reverse gears. A long track frame and 18-in. shoes combine the characteristics of flotation, traction, and resistance to side slip. Bucket controls are operated with one hand and the lift control remains in position when set so that the bucket will lift and stop automatically while the operator is working other controls. It is called the No. 6 shovel.

• Stockpile Attachment

A high-speed attachment for stockpile loading has been developed for the Athey Model 3 Force-Feed Loader. The attachment, which is designated as the "Bulldozer Moldboard-Auger Feeder" is available as original equipment or as an attachment for machines in use.

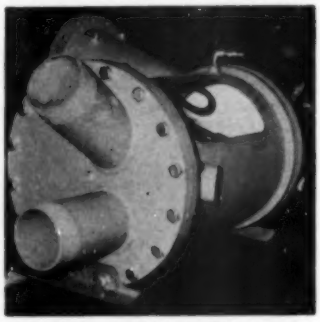
The attachment consists of a 90-in. bulldozer-type moldboard which provides a wide gather area and positive hydraulic down pressure on reversible cutting edges. The moldboard has sideboards at each

end. These side boards may be set in a forward position for windrow loading or in a rearward position for stockpile operation. In the latter instance the sideboards prevent material from building up in front of the wheels. The attachment is designed for use on all free-flowing materials such as coal, sand, gravel, crushed stone and ores. It is made by Athey Products Corporation, 5631 W. 65 street, Chicago 38, Ill.

• Diversion Valve

A diversion valve for air-blown powdered materials has been brought out by the Cab Design Corporation, 11-08 131 st., College Point 56, N. Y.

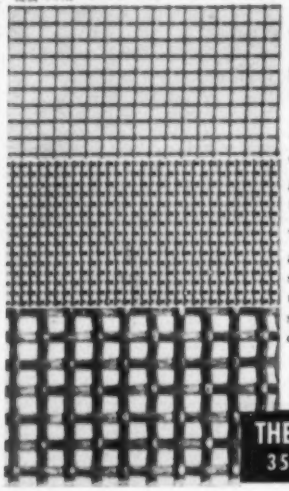
The valve features a "transition cage" as the rotatable element instead of an



eccentrically rotated plate. The cage provides for unrestricted flow in either straight-through or diverted position. Rotation of the cage is either manual or air-cylinder. The Cab Valve is designed for use with pneumatic conveying systems.

BONUS TONNAGE AND SERVICE

MORE TONS MORE TONS MORE TONS MORE TONS MORE TONS



WITH CLEVELAND WIRE SCREENS

You get *Bonus Tonnage* and *longer life* with "Cleveland" Wire Screens. They resist abrasion and fatigue because they have toughness and ductility.

"Cleveland" Wire Screens maintain rigid accuracy of openings in day-in, day-out shattering action of high-tonnage vibrating units. No loss in production, no loss in shut-down time mean *more tonnage* and *extra profits* for you.

Write for Bulletins No. 5 and 6

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 79th STREET • CLEVELAND 5, OHIO

● Scene at the Louisville Crushed Stone Company's mine, Louisville, Ky., where a tractor equipped with a bulldozer piles up shale after it has been broken up with black rippers attached to the rear of the bulldozer blade.

● Ora G. Brown (left), mine superintendent, and James Sanders, tractor operator, check the back ripper teeth with bulldozer blade raised on the tractor.

Back Rippers Found Useful For Removing Shale Layers

Back rippers mounted on a bulldozer blade have proved the answer to the troublesome problem of removing thin layers of shale covering limestone deposits at the Louisville Crushed Stone Company's mine in Louisville, Ky.

One of the company's recent problems was the removal of a 7- to 9-ft. thick layer of shale from the top of the limestone deposit. The bulk of the shale was removed by blasting. However, after the blasting there still remained a troublesome layer of shale 3 to 18 in. thick.

After the Preco back rippers, attached to the bulldozer on a Caterpillar D8 tractor, came into the picture, the unit would break up the shale while backing, then reverse its direction and doze the waste material into a pile, where it could be shovel-loaded into wagons for removal from the mine. This ripping process accomplished in one hour what it formerly required two days using other methods.

The back rippers were first called into service last year to remove a vein of soapstone of about the same thickness as the shale. After this the unit became an invaluable part of the mine's equipment, which also includes a Caterpillar No. 12 motor grader, two Lorain Model 820-J shovels powered by Caterpillar D12000 engines, and a 365-cu. ft. Gardner-Denver air compressor powered by a Cat D8800 engine.

Another use this company has found for back rippers is for loosening agricultural lime, or dust, which is stockpoled at its processing plant. In storing this lime in huge piles, the dump trucks must be continually running over the pile. This packs down portions of the pile so that it cannot be easily removed. Formerly these portions were loosened by blasting. Now the Preco back rippers are uses to break it up so that it can be loaded for shipment.

HARRY E. LEWIS has been named executive director of the Industrial Mineral Wool Institute of New York, N. Y. Previously he had been associated with the following firms: the Great Lakes Carbon Corporation (Perlite Division), the Eagle-Picher Sales Company, and the Owens-Corning Fiberglas Corporation.

Make Your Own Lightweight Aggregate at LOW Cost!

Typical Dwight-Lloyd Lightweight Aggregate Sintering Plant.

Aggregate cakes leaving pallets at discharge end of sintering machine.

Make your own expanded aggregate—light, strong, stable and with superior wet-dry contraction characteristics—from clay, shale, fly ash and other suitable residues or waste materials, using the

DWIGHT-LLOYD® SINTERING MACHINE

- LOW PRODUCTION COSTS—Automatic operation, no skilled labor required.
- CONTINUOUS OR INTERMITTENT—Operate 24 hours a day or intermittently without loss of efficiency, standby or restarting costs.
- LONG LIFE—LOW MAINTENANCE—Many plants in continuous operation for over 30 years with exceptionally low maintenance.
- CAPACITIES—Standard machines available from 250 to 2,500 cubic yards per day.

Pilot Sintering Plant at your service for testing materials under actual operating conditions. Let us test your raw materials and offer our recommendations to meet your requirements.

LIGHTWEIGHT AGGREGATE DIVISION
SINTERING MACHINERY CORPORATION
130 SINTER AVENUE NETCONG, N. J.

trade notes

William C. Ridge has been appointed works manager in charge of the manufacturing operation of the Trenton and Roebling, N. J. plants of the John A. Roebling's Sons Corporation.

C. Lynn Frost has been appointed advertising manager of Hewitt-Robins Incorporated, responsible for the advertising of all the company's products. Mr. Frost joined Hewitt-Robins. in 1949.

COLUMN SHOWERS
(FOR GROUP USE)
AT
LOW COST

REQUIRE ONLY 3 PLUMBING CONNECTIONS

• Here's the answer to your Shower requirements at low cost.

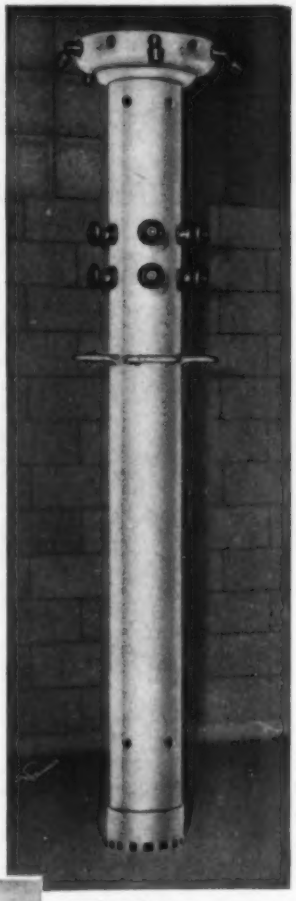
Without the usual partitions of the 3-stall or 5-stall Bradley Showers, the Column Showers are otherwise complete with drain fittings, sprayheads, soap trays, mixing chamber for temperature control with hot and cold water control valves. Ready to install.

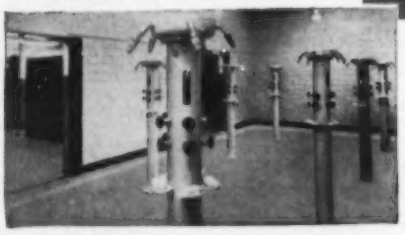
Floor space is saved and by placing Showers away from walls, wall waterproofing is not required and space may be used for lockers and benches.

Ideal for Factories, Mines, Camps, Schools, Field Houses, Institutions.

BRADLEY WASHFOUNTAIN CO.
2299 W. Michigan St., Milwaukee 1, Wisconsin

BRADLEY Showers
Distributed through Plumbing Wholesalers





Left: Installation of 8 Bradley Column Showers

Write for Catalog 5204

B. J. O'Hearn, former Multiwall sales representative, has been named to the new post of southwestern district manager for Multiwall Bag Sales Union Bag and Paper Corporation. His territory is composed of the states of Colorado, Utah, Wyoming, Kansas, Missouri, Southern Illinois, Arkansas, Lousiana, Texas and Oklahoma.

E. T. Nelson, formerly assistant western district manager, becomes western district manager for Multiwall Bag Sales. His district comprises the states of North Dakota, South Dakota, Nebraska, Iowa, Northern Illinois, Minnesota, Wisconsin and Michigan.

Harry E. Beane has been appointed vice president of sales of The Bristol Company, Waterbury, Conn., according to an announcement.

He joined the sales engineering organization in 1920 and became district manager of the Birmingham, Ala., and the Pittsburgh offices.

In 1943 he was made sales manager of the Instrument Division and in 1947 promoted to general sales manager.

Ehret and Kinsey, Chicago, who represent The Cleveland Worm & Gear Company and The Farval Corporation, announce the opening of a Milwaukee office at 2400 West Clybourn, Milwaukee 3, .Wis.

The Milwaukee office will be in charge of James A. Gramling, an engineer who has been calling on the industrial plants in the Milwaukee and Wisconsin area for a number of years.

Galion Allsteel Body Company, Galion, Ohio, announced the appointment of R. H.Tomlinson as regional representative.

Mr. Tomlinson will direct sales and service of Galion Products in Kentucky, Alabama, Mississippi, Lousiana and Arkansas.

It has been announced by Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, that J. V. (Jess) Gunter has been appointed sales representative for Lima shovels, cranes and draglines. Mr. Gunter will assist Fred L. Maus, district manager, in the States of Tennessee, North Carolina and South Carolina.

The B. F. Goodrich Company's industrial advertising campaign has been called "the best of 1952" and H. E. Van Petten, advertising manager of the company's industrial and general products division, has been named "adman of the year" by Industrial Marketing Magazine.

The appointment of Ernest F. Bentley as general sales manager of the Detroit Diesel Engine Division of General Motors has been announced. Mr. Bentley, succeeds V. C. Genn whose death occurred in January.

Other appointments which have been announced include Robert V. Baxley, as operations sales manager; John C. Campbell, as manager of manufacturers' sales and Louis A. Steele, as industrial sales manager.

The W. H. Anderson Company, Detroit, Mich., has announced the appointment of Robert A. Nussmeier as Euclid equipment specialist for the company. Mr. Nussmeier's full time will be given over to advisory work and consultation regarding industrial and construction engineering of material handling and movement by Euclids.

The Timken Roller Bearing Company has announced the appointmnet of Robert G. Morgan as district manager, Moline, Illinois office, and Robert L. Williams as district manager, St. Thomas, Ontario office.

Raybestos-Manhattan, Inc. has moved from 445 Lake Shore Drive into a newly constructed Chicago office and warehouse building at 6010 Northwest Highway. This building provides expanded facilities for warehousing mechanical rubber, packings and asbestos textiles and for Chicago sales offices of these products as well as national sales headquarters for the Equipment Sales Division.

Symons Clamp & Mfg. Co., Chicago, Ill., manufacturers of forms, shore, column clamps and accessories, has announced the appointment of J. D. Lockie as plant superintendent.

Appointment of R. E. Brooks Co. of Hasbrouck Heights, N. J., as dealers in Hyster industrial truck equipment has been announced by Hyster Company officials.

The firm has signed sales and service agreement for northern New Jersey.

The territory includes the following New Jersey counties: Sussex, Passaic, Bergen, Essex, Morris, Warren, Hunterdon, Mercer, Monmouth, Middlesex, Somerset and Union.

The Euclid Road Machinery Company has announced the appointment of the Ray-Brooks Machinery Company as distributor for the southern half of Alabama.

Robert G. Squibb has been appointed regional sales manager for Sunbury Wire Rope Sales Company in New York and New England.

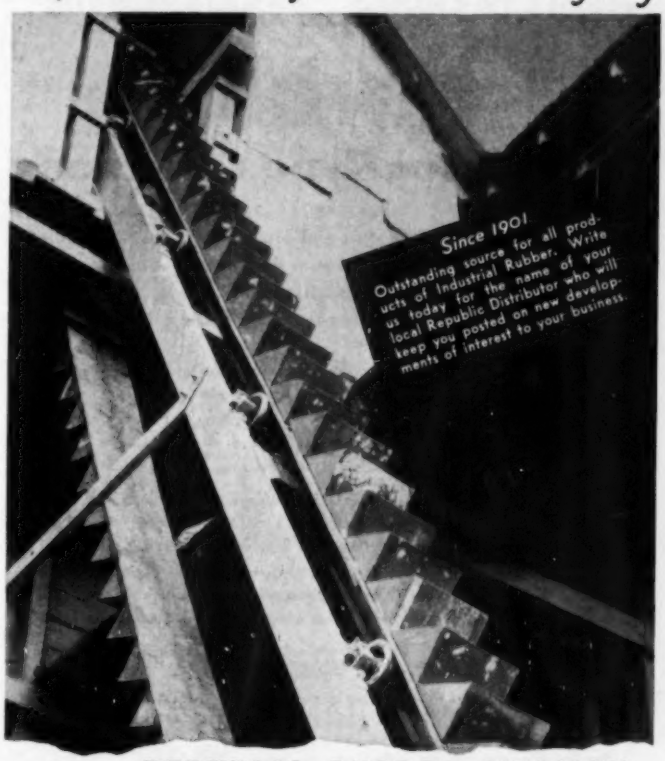
Hammond Bag & Paper Company has announced the appointment of G. A. (Al) Martin as special sales representative who will represent the company in the states of Michigan, Ohio, Kentucky and Southern West Virginia. He will work out of the general office of the company at Wellsburg, W. Va.

Carl E. Johnson died recently at his home in San Marino, Calif. Mr. Johnson was one of the founders of Sterling Electric Motors, Inc. He was born in Chicago in 1883, and came to San Francisco in 1903. In 1906 Mr. Johnson organized the first company on the West Coast for the manufacture of electric motors and generators. He made many contributions to the electric motor field, being responsible for about 55 patents for electrically driven deep-well turbine pumps, die casting of induction motor rotors, across-the-line starting motors, and many others.

endurance test record **PROOF:**

● Every belt tested had an equal chance to perform. It was a primary crusher installation at a large Southern quarry. A tough job, and, an important one, because a breakdown here meant work stoppage in the entire plant. Performance of ordinary belts varied. Some lasted longer than others, but not one approached the record made by Republic's EXCELO Elevator Belting. This rugged belt outlasted all the others. It worked steadily for a two-year period without a single breakdown. It required less maintenance, showed less signs of wear, did far more work at less cost than was previously thought possible! Republic Elevator Belts chalk up performance records like this everywhere they're used. Republic Elevator Belts are expertly matched to your job by local men who really know your specific problems. So, don't gamble on results. It costs less to use the best . . . REPUBLIC ELEVATOR BELTING!!

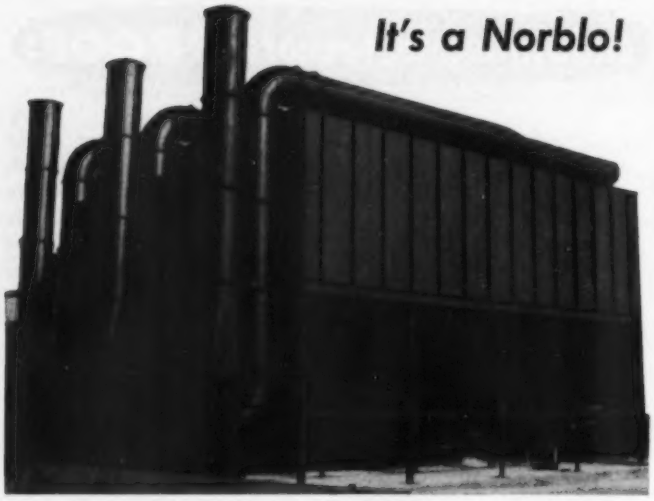
Republic builds toughest Elevator Belts going


Since 1901
Outstanding source for all products of Industrial Rubber. Write us today for the name of your local Republic Distributor who will keep you posted on new developments of interest to your business.

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS



Important dust control jobs from coast to coast use

Norblo

Automatic Bag Type Collection

Of all the major types of dust and fume collection systems, the modern automatic bag type process as developed by Norblo is the most widely useful and adaptable. Its use in important large scale production processes extends from coast to coast, and to foreign lands.

Continuous operation at full rated capacity — handling heavy dust loads by maintaining a constant suction drop across the arrester — is the performance that Norblo Equipment delivers day after day.

There is *no down time* with a Norblo Automatic Bag Type Arrester. Rugged construction, basic unit compartment and few moving parts combined in a fully functional coordinated design insure very high efficiency and low cost of operation and maintenance.

Norblo also builds centrifugal and hydraulic dust collectors, exhaust fans, cement air cooling systems, and portable type dust collectors. Write for literature on any of these.

The Northern Blower Company

Engineered Dust Collection Systems for All Industries

6407 Barberton Ave. OLympic 1-1300 Cleveland 3, Ohio

Builders Structural Steel Corporation, Cleveland 15, Ohio, has announced the appointments of Walter Schneider as contract manager of the Fabrication Division, and of Frank T. Shiba as manager of sales for the Structural and Ornamental Divisions.

Wendell Kinney, vice-president of Standard Steel Corp., Los Angeles, sailed for Europe on the Queen Mary recently. While abroad, he will survey highway construction projects and developments in processing industries, as well as negotiate licensee arrangements for Standard asphalt plants, rotary kilns, driers and coolers.

Paul L. McCullough Jr. has been appointed sales manager of the Electro-Alloys Division of the American Brake Shoe Company.

Mr. McCullough joined the company as a trainee in 1945. He became a sales engineer in 1947 for the American Manganese Steel Division and the Electro-Alloys Division. In 1951 he was appointed district sales manager for the Amsco Division in Pittsburgh.

Chase Bag Company's annual Managers and Sales Managers Meeting was held in Chicago in February. The promotions of R. N. Conners to executive vice president and W. N. Brock to general sales manager highlighted the meeting.

The appointment of new distributors for territories in Wisconsin, California and Florida has been announced by the Koehring Company, Milwaukee, Wisc.

In Wisconsin, Kelbe Bros. Equipment Co., 5686 North Teutonia Avenue, Milwaukee, will handle Koehring products for the entire territory. The line includes equipment manufactured by Koehring and its subsidiary companies: Parsons Company, Newton, Ia., C. S. Johnson Company, Champaign, Ill., and Kwik-Mix Company, Port Washington, Wisc.

In Florida Allied Equipment, Inc. 825 N. W. 72 Street, Miami, was named to handle Koehring products only in the 13 southern counties of the state.

The Northern California territory has been delegated to the Standard Machinery Company, 450 Bayshore Boulevard, San Francisco. Standard Machinery also will handle the sale of Parsons products.

The Timken Roller Bearing Company has announced the appointment of Richard K. McConkey to the post of assistant general manager of the Industrial Division. Mr. McConkey was formerly district manager of the Industrial Division at the Moline, Ill., office. He succeeds the late Melvin H. Kuhl.

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, announced the appointment of Stan Houston Equipment Company, 2514 South Minnesota Avenue, Sioux Falls, S. Dak., as distributor for Lima shovels, cranes and draglines in the state of South Dakota.

The election of S. K. Bradley as vice-president in charge of Multiwall Bag Sales for Union Bag and Paper Corporation has been announced. A member of the Union organization since 1938, Mr. Bradley previously served as director of Multiwall Bag Sales.

Several additions to the field organization of the Detroit Diesel Engine Division of General Motors has been announced.

C. J. Davy, who has been with Detroit Diesel's Petroleum sales department, has been appointed sales representative in Alabama, Georgia and Florida. R. J. Hines has been assigned to Eastern New York, Eastern Pennsylvania, New Jersey, Maryland and Delaware.

J. R. Sayward, R. T. Hair, C. J. Saurer and H. S. Pillsbury, former instructors in Detroit Diesel's mobile training schools, have been added to the field service staff.

The addition of seven distributors for Alloy Rods Company's alloy arc welding electrodes was announced.

The new distributors are: Altoona Auto Accessories Co., Altoona, Pa.; Mississippi Supply Co., Chicago, Ill.; Central Welding Equipment Co., Fort Smith, Ark.; Bailey Welding Supply Co., Houston, Tex.; Randall-Graw Company, Inc., LaCrosse, Wis.; R. & G. Auto Supply Co., Valley City, N. Dak., and Worland Oxygen Co., Worland, Wyo.

Oliver United Filters Inc., New York, Chicago and Oakland, announced local sales and engineering representation in Southern California, Arizona, Nevada and New Mexico. R. M. Stampley, long with the Oakland office, has been assigned to this territory, with offices in the Statler Building, 900 Wilshire Blvd., Los Angeles.

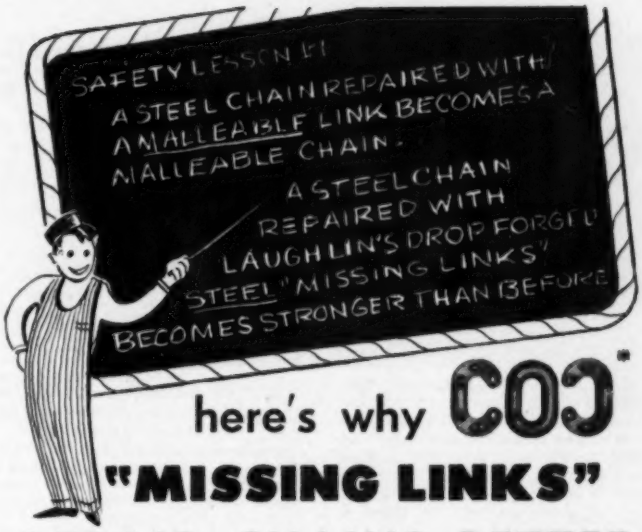
E. V. Huggins has been elected vice-president of corporate affairs for Westinghouse Electric Corporation by the Board of Directors. This is a newly created position with the company. He was also elected president of Westinghouse Radio Stations, Inc., by that Board of Directors.

Joseph E. Baudino was elected executive vice-president in charge of all operations. Mr. Baudino was formerly general manager of all operations.

Marion Power Shovel Company, Marion, Ohio, has announced the appointment of two new sales representatives. William B. McCausland has been appointed to the company's district office in New York City, and E. Edward Staker has been appointed to the Northwestern Ohio territory.

Appointment of Richard Kinder as national account representative for Hyster Company has been announced. He will make his headquarters at the Chicago office.

Appointment of J. P. Coughlin as manager of the arc welding department of the Westinghouse Electric Corporation has been announced.


SAFETY LESSON #1
A STEEL CHAIN REPAIRED WITH A MALLEABLE LINK BECOMES A MALLEABLE CHAIN.
A STEEL CHAIN REPAIRED WITH LAUGHLIN'S DROP FORGED STEEL "MISSING LINKS" BECOMES STRONGER THAN BEFORE

here's why COO*

"MISSING LINKS"

REPAIR CHAINS BETTER

"MISSING LINKS"

MATCHED

Made with special dies so that each half is pressure fitted. This eliminates play between the forgings, insures perfect fit when riveted into chain. There is no strain on the rivets.

INTERLOCKING LUGS

More costly to put in the dies, but they grip firmer and really do the work of taking the load.

ORDINARY LINKS

UNMATCHED

When loose fitting links are put into a chain and the load is applied, the rivets take most of the strain and tend to shear until the links set. This may later cause the link to open up under heavy load.

ROUND LUGS

Ordinary round lugs fitting into round holes don't have the holding power, tend to shear or force out under strain.

Laughlin "Missing Links" are made of carefully heat treated, high grade steel. They have features found in no other repair links, and are also supplied in an exclusive pear shaped design in sizes for 3/8" to 1 1/8" chain.

Buy From Your Local Distributor

He is in business to give you prompt, courteous service and to save you money, time and trouble. He's your one best source for industrial supplies.

FOR SAFETY'S SAKE SAY LAUGHLIN

THE THOMAS LAUGHLIN CO.
522 Fore St., Portland, Me.

*T. M. Reg.

Eleven staff appointments have been announced in the three new departments of the General Electric Company's Motor and Generator Division.

In the Medium Induction Motor Department, the following were named section managers: George I. Clover, manager of manufacturing; Glenn A. Cook, manager of finance; Charles J. Koch, manager of engineering; Joe T. Farrell, manager of marketing; Karl F. Lathrop, manager of employee relations; and Dwight E. Moorhead, manager of the San Jose (Calif.) Plant.

The Marketing Department, announced the establishment of a product planning practices section with Edward A. Green as manager.

Four men were named section managers in the Synchronous and Specialty Motor and Generator Department at G.E.'s Lynn (Mass.) River Works. They include Bascom H. Caldwell, manager of engineering; Lyman E. Sproul, manager of finance, James M Sullivan, manager of manufacturing; and David A. Yates, manager of marketing.

Electric Steel Foundry Company, Portland, Ore., announced the opening of a branch office in Salt Lake City, Utah.

The office will cover the intermountain territory comprising Utah, Colorado, Southeastern Idaho and Southwestern Wyoming.

Garland T. Allen, who has been representing ESCO in the Portland area for about 11 years, is manager of sales in the Salt Lake City office.

A. C. Brown Jr., regional manager of Air Reduction Sales Company has been appointed general sales manager, it was announced.

Mr. Brown has served in various capacities including salesman and branch manager at Grand Rapids, Mich. and district manager at Cleveland, O. In 1950 he was appointed manager of the Central Region with his office in Pittsburgh, Pa., a post held until this promotion.

J. H. Keeney, administrative assistant in Pittsburgh, succeeds Mr. Brown as regional manager. J. H. Hart, Detroit district manager, succeeds Mr. Keeney. R. A. Jamieson, assistant sales manager, Detroit, succeeds Mr. Hart.

Three appointments have been announced by the sales department of the Brake Shoe and Castings Division of American Brake Shoe Company. John F. Ducey, Jr., has been named vice-president, George E. Anne becomes assistant vice-president and Daniel J. Wagner is district sales manager.

Chain Belt Company, Milwaukee, announced the appointment of Gilbert J. Schuelke as assistant sales manager of its Chain and Transmission Division.

Mr. Schuelke started with Chain Belt Company in 1936 as an engineering apprentice. He served in various engineering and sales assignments in the company's Milwaukee works, and in its District Sales offices in Atlanta and Milwaukee.

W. T. Willey

The formation of a new Southwest District of the Republic Rubber Division, Lee Rubber and Tire Corporation, has been announced.

W. T. Willey, formerly field representative in Houston, has been appointed district manager with headquarters in Tulsa, Okla.

Other members of the new district sales organization are R. J. Cravens who will headquarter in Dallas, D. L. Cushing in Houston and R. E. McQuiston in Midland, Texas.

The W. W. Sly Manufacturing Company, Cleveland, Ohio has promoted William L. Horr to the post of district sales manager in the Philadelphia area.

Mr. Horr has been with Sly over three years as a sales engineer in the New York district.

F. Dier Tincknell was elected treasurer of Chain Belt Company, it was announced. He succeeds George M. Dyke who has retired as treasurer after thirty years of service with the company. Mr. Tincknell has been identified with its division of finance and accounts since joining the firm in 1943 and was assistant treasurer prior to his recent election.

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At the recent convention of the American Road Builders Association the following men were elected officers of the Manufacturers Division for 1953: President: Harold T. Reishus, General Manager, Industrial Power Division, International Harvester Co., Melrose Park, Ill.; First Vice President, Ray McLean, President, Jaeger Machine Company, Columbus, Ohio; Second Vice President: L. G. Schraub, Vice President, Union Wire Rope Corporation, Kansas City, Mo.; Secretary-Treasurer: Roy E. McCluskey, Vice President, R. G. LeTourneau, Inc., Peoria, Ill. Harold F. Hess continues as Executive Vice President.

Allis-Chalmers industrial tractor dealers now offer 4-wheel scrapers according to the Allis-Chalmers Manufacturing Company's Tractor Division, Milwaukee, Wisc. The line includes seven models with truck capacities ranging from 2 to 18 cubic yards.

This line was made available through the integration of four A-C models, formerly manufactured by LaPlant-Choate, with three made by Gar Wood.

H. J. (Herb) Howerth, Jr. has been named assistant sales manager of the Wayne division of Gar Wood Industries, Inc., according to an announcement.

Mr. Howerth, who served as chief sales engineer for the Wayne division until his recall to military service two years ago, has returned from a year in Korea.

American Wheelabrator & Equipment Corporation, Mishawaka, Ind., has made promotions in and additions to its field sales personnel. K. E. Blessing has been promoted to the post of district manager of the sales office at 53 Newark Street Bldg., Hoboken, N. J. The addition of F. John Pichard to that office as sales engineer was also announced.

George F. Burditt has been appointed district manager of the Pittsburgh office, 91 Central Square, Pittsburgh 28, Pa. He has been with the company for more than five years.

George C. Tolton has been appointed district manager of the Greensboro, N. C. office, 211 W. Sycamore, Greensboro. Mr. Tolton was formerly in the Seattle, Wash. office. for more than 6 years.

Appointment of a national sales representative together with an expanded production program has been announced by the Tennefos Manufacturing Company, Moorhead, Minnesota. The new sales representative, F. M. Hermanson of Fargo, N. Dak., will set up dealers in a 16 state area.

The Independent Pneumatic tool company voted to change its corporate name to Thor Power Tool Company. The trade name "Thor" has been used as identification of all of the firm's power tools since 1893 and, according to Mr. Hurley, President, the new name utilizing the trade mark will eliminate confusion and facilitate easier recognition of the company's products.

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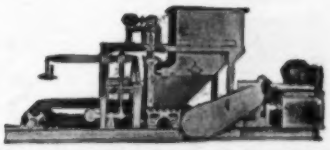

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legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Duty of Land Owner

Considerable discussion has arisen from time to time over the legal question: "What is the legal duty of a property owner to maintain a public sidewalk which he has altered or constructed?"

According to a late higher court decision, both the property owner and the city may be liable for injuries to pedestrians caused by dangerous defects in a sidewalk.

For illustration, in *Peters v. City and County of San Francisco*, 250 Pac. (2d) 675, the testimony showed facts as follows: A pedestrian sued the city and property owner for injuries received when he fell on a portion of a concrete sidewalk which had been altered into a driveway leading into a garage.

The higher court held as follows: A property owner is under no legal duty to maintain in safe condition a public street abutting his property, but he is liable for the condition of a public sidewalk which he has altered or constructed for the benefit of his property. Also, this court held that the city may be held jointly liable, and said:

"The liability of abutting property owner for a condition of the sidewalk maintained for his sole and exclusive use and benefit is a liability imposed under common law principles of negligence and nuisance. The liability of a municipality for the dangerous or defective condition of a sidewalk is a statutory liability."

In other words, a city is not liable for defective conditions of a sidewalk, unless a state law so provides, but the property owner who constructs, repairs, or alters the sidewalk always is liable, irrespective of state or city laws.

Zoning Ordinance Held Valid

Considerable discussion has arisen from time to time over the legal question: When and under what circumstances may

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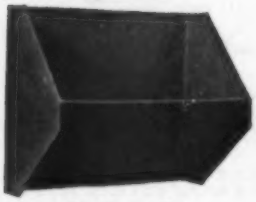

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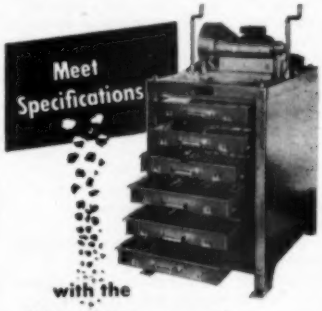

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BOX 186 • MERCER, PENNA.

a municipal board issue a building permit in variance or violation to a residential zoning ordinance?

According to a recent higher court the answer is as follows: A variance to a zoning ordinance may be granted only upon proof: (1) that the land cannot yield a reasonable return if used only for residential purposes; (2) that the plight of the land owner is due to unique circumstances and not to the general conditions of the neighborhood; (3) or that the use sought will not alter the essential character of the residential neighborhood.

If the property owner who desires to construct and use business property in a residential zone fails to prove these points, he cannot receive a valid permit.

For example, in *Taxpayers v. Board of Zoning*, 93 N.E. (2d) 645, the testimony showed that one Roberts was granted a permit by the municipal board of zoning permitting him to erect a commercial building and repair shop in an area zoned as a residence "B" district.

Suit was filed by nearby property owners, who asked the court to repeal the permit.

Since the property owners proved that the new business would alter the essential character of the residential neighborhood and Roberts failed to prove otherwise, the higher court held the permit void.

"Carry-All" Is Trailer

According to a late higher court decision a "carry-all" or "scraper," pulled by a motor vehicle, must be registered and taxes paid for its use on the highway, as a trailer.

For example, in *People v. Pakchoian*, 250 Pac. (2d) 765, the higher court held that a four-wheel Le Tourneau "scraper or carry-all" which is towed on a public highway, and designed for automatic pickup and moving of free earth, without regard to where the earth may be, is a vehicle in which a person could be propelled, moved, or drawn upon a public highway and therefore is not exempt from registrations.

This was held although the owner contends that this "scraper or carry-all" is not a vehicle within the meaning of the law. Nevertheless, this court held that the scraper must be registered with the state, and taxes must be paid therefore. The court said:

"Under the law a 'carry-all' is a vehicle, and should be classified as a trailer or semi-trailer, according to type, and is required to be registered when it is operated on a public highway."

Not Within Scope of Employment

Recently a reader asked this question: "Under what circumstances is the owner of a quarry not liable for negligence of an employee?"

The answer is as follows: When the employee is not acting within the scope of his regular employment, the quarry company is not liable.

For example, in *McNew v. Puget Sound Company*, 224 Pac. (2d) 627, the testimony showed facts as follows: One Nelson was employed as head cook in a camp. On week-ends he visited his family in a town named Everett, some miles away, where good stores were plentiful. One day the manager of the camp asked Nelson to bring back some merchandise and articles from stores, since such merchandise and articles were not available in the camp and were much needed. Nelson journeyed to Everett, where he purchased the merchandise, and then visited his family. On Sunday he loaded the purchased articles into his automobile and proceeded over the usual route towards the camp. While driving on the wrong side of the highway, he collided with another automobile, causing his death and injury to its occupant, named McNew.

The question presented the court was: Can the dependents of Nelson recover compensation from his employer? And can McNew recover damages from Nelson's employer since his injuries resulted from negligence of Nelson?

The higher court held the employer not liable in either case because Nelson was not acting within the scope of his regular employment when the accident happened. The court said:

"The accident did not occur while he was on the way to purchase the supplies, and the fact they were in his automobile was merely incidental and contributed in no way to the accident. It is our opinion that at the time of the accident Nelson was on a journey of his own, and what he had done or was doing to accommodate his employer was not done in the course of or scope of his employment as head cook."

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On the other hand, it is important to know that many higher courts have held that if the work of the employee creates the necessity for travel, the court may hold that he was in the course of his employment although he was serving at the same time some purpose of his own. Yet, as above explained, if the work for the employer had no part in creating the necessity for travel, and the journey would have been made anyway by the employee, there would be no employer liability. For higher courts which upheld this law see: *Marks Dependents v. Gray*, 251 N.Y. 90; *Mandell's Case*, 322 Mass. 328; *Barraquar v. Industrial Commission*, 205 Wis. 550, 78 A.L.R. 679; *Murphy v. Board*, 314 Mich. 226; and *Cunningham v. Union Chevrolet Company*, 177 Tenn. 214.

Rock Is Available

Modern higher courts consistently hold that a contractor who accepts a contract to supply materials and do work at a specified location, generally, must make his own investigations to determine whether such materials are available. But a leading higher court has held that a contractor may rely upon positive representations made by a property owner.

For instance, in *United States v. Johnson*, 153 Pac. (2d) 846, it was shown that a property owner called for bids for the construction of a project and furnished plans and specifications upon which bids might be based by contractors. One statement in paragraph 2 of the specifications was as follows: "Gravel for crushing is available approximately 0.3 mile" from a named point.

A contractor named Johnson examined the surface of the site of the projected rock quarry. Later he submitted a bid which was accepted and a written contract was entered into for the work.

After starting the work Johnson discovered that there was soft rock beneath the surface. He notified the property owner's engineer of the difficulty; and after further investigation it was decided to proceed, making the best of it. The quarry was shot and a dragline to the rock crusher installed. The contractor experienced difficulties, and each occurrence was followed by a shutdown for three or four days.

After the job was completed, the contractor sued the property owner for damages and extra payment. The property owner argued that paragraph 2 was not a guarantee that there was an adequate supply of suitable rock at the source designated. Nevertheless, the higher court awarded the contractor $10,000 damages, or extra payment, and said:

"Here there was a deceptive representation that rock suitable for crushing was 'available' at a given point. . . . The contractor, in estimating costs, was entitled to figure his bid on that assumption."

Also, see *Sheridan-Kirk Contract Co. v. United* 53 Ct. Cl. 82. Here the Supreme Court of the United States held a property owner is liable for misrepresentations regarding the depth of bedrock.

Average Care

A leading higher court has held that an employer is not required to provide more than an "average" safe working place for his employees.

For illustration, in *Wommack v. Orr*, 176 S.W. (2d) 477, an employee sued his employer for $25,000 damages. He testified that while he worked, dust accumulated on his face and his clothes and got into his nose and eyes and ears. Also, the employee testified and proved that he contracted a disease because you "could see dust in the air through the sunshine any time you wanted to look for it".

However, the employee failed to prove that other employers in the same business used "greater care" to protect employees against the contraction of disease. The higher court refused to hold the employer liable in damages, and said:

"No one is held by the law to a higher degree of care than the average in the trade or business in which he is engaged. . . . A man, in conducting his business in the way that everybody else in a like business does, has exercised the ordinary care of prudent men engaged in the business."

Negligence of Employee

Under no circumstances may an injured employee recover damages from an employer unless he proves negligence on the part of the employer. Stating the law in a different way: All employees who are injured while working within the scope of the employment are generally entitled to recover compensation under the State Workmen's Compensation Act. However, if an injured employee sues an employer for damages, the employee cannot recover unless he proves definitely that the injury resulted from his employer's negligence, and not his own negligence.

For illustration, in *Central Company v. Gemmendo*, 178 S. W. (2d) 217, it was shown that an employer failed to provide compensation insurance for his employees. However, the employer did not violate any state laws by this failure.

An employee was struck on the head by a rock, and he sued his employer for damages. Although the lower court held in favor of the employee, the higher court reversed the verdict and said:

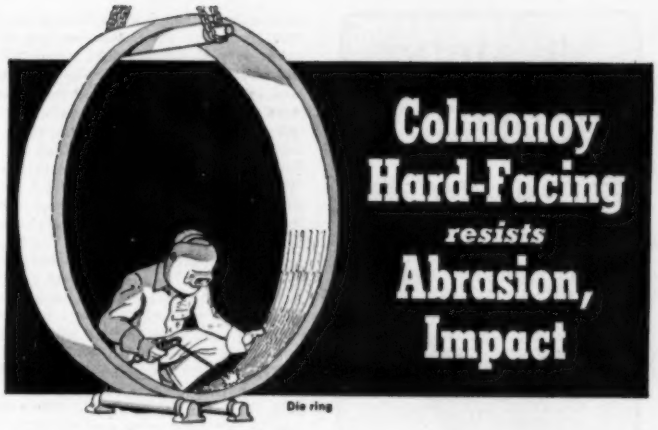
"The employer may show by evidence an absence of negligence on his part, as well as evidence that the employee's negligence was the proximate cause."

In other words, an employee who is injured through his own negligence never can recover damages from his employer.

Adequate Damages Are Allowable

Recently a higher court rendered an unusual decision to the effect that no contractee may recover more damages than he actually sustained, irrespective of other provisions in the violated contract.

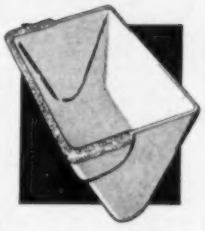
For instance, in *Avery v. Fredericksen and Westbrook*, 154 Pac. (2d) 41, the testimony showed that a property owner and a sand and gravel company made a contract which clearly specified that be-



Die ring

The examples shown here speak for themselves: Colmonoy meets every hard-facing need with a good alloy and an easy way to apply it.

DIE RING, above, is an excellent example of the use of Colmonoy No. 1 in resisting impact and abrasion. More and more Colmonoy is being used on this and other 'rough' applications, where earth and bulk materials are handled. Colmonoy Special No. 1 is used where abrasion factors outweigh the value of impact resistance. Both alloys are applied easily by electric arc.

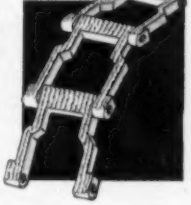

Elevator bucket

ELEVATOR BUCKET LIPS withstand the most extreme wear when hard-faced with Colmonoy Sweat-on Paste. Applied with a spatula, and fused with carbon-arc welding, its hardness of 68-72 Rockwell C gives the utmost in abrasion resistance. Thin sections can be hard-faced with a minimum of distortion by spreading Sweat-on Paste with a brush, and fusing with an oxy-acetylene torch.

Drive sprocket

DRIVE SPROCKETS are best protected with Colmonoy No. 6. Colmonoy No. 6 will give unmatched service on this abrasive application, and it has the unique advantage of being easily formed during its plastic range (1900°—2050° F). After applying Colmonoy No. 6 by oxy-acetylene welding, the deposit is hot formed with a simple die. Excess deposit is wiped off with a cast iron rod. It will outlast hardened steel by four times.

DRAG CHAIN LINKS last longer when hard-faced with the newest iron-base alloy, Wallex. Available in bare and coated rods, Wallex has excellent abrasion resistance, and very good impact, corrosion, and galling resistance.


Drag chain links

The applications mentioned above are but a few of hundreds that have proved the value of Colmonoy alloys in extending equipment service life.

Write for Colmonoy Hard-Facing Manual No. 77. It gives a two-page hard-facing guide and a complete table on the properties of all Colmonoy alloys.

HARD-FACING ALLOYS

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REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

fore removing sand and gravel from the land from the three and one-half acre tract of land the company would strip one foot of top soil from the property; and after all of the sand and gravel had been removed, the company would level off the property from which material is removed, and replace the top soil.

The company proceeded to remove 100,000 cu. yd. of sand and gravel from a three and one-half acre tract, but it did not level off the land, nor replace the top soil. The property owner sued the company for $10,400 damages which he proved was the reasonable cost of leveling off the three and one-half acres and replacing the top soil.

The higher court listened to the testimony and agreed that it would cost approximately $10,000 to level off the three and one-half acres and replace the top soil. However, the court also found that the actual value or present sale price of the three and one-half acres of land was less than $100. In view of this information, the higher court held the sand and gravel company liable to the property owner for less than $100, instead of $10,400. The court said:

"In the case before us the market value of plaintiff's (property owner) land has not been depreciated, he has been allowed the full value thereof, and still has the land. It cannot be said, therefore, that he has suffered any detriment for which he is not compensated."

For comparison, see *Perkins v. Blauth*, 127 P. 50. Here a company with a dredger cut through a levee along a river with the result that valuable lands were inundated from overflow of waters from the river.

In subsequent litigation the higher court held that the difference in the market value of the land before and after the injury was the proper measure of damages which the company must pay to the property owner, although the property owner argued that the company should be compelled to replace the land as it was before it had negligently cut through the levee.

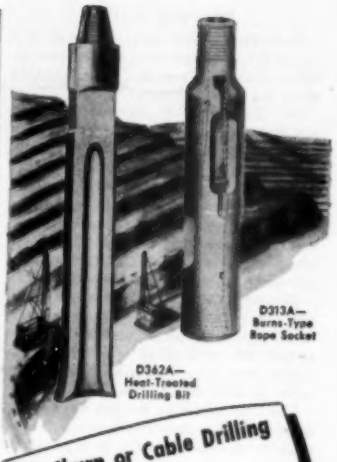
Federal Trade Commission

The courts hold that the Federal Trade Commission has proper authority to order a seller or manufacturer to cease advertising its product falsely.

For illustration, in *C. Corporation v. Federal Trade Commission*, 189 Fed. (2d) 359, the Federal Trade Commission issued an order requiring a company to cease and desist making certain representations as to the effectiveness of its products as waterproofing agents.

For the purpose of inducing the purchase of its products the company circulated advertising folders, pamphlets, and circular letters. Typical of the statements contained therein are the following:

"You can now permanently stop all leaks and seepage in concrete, brick, stone and tile; also waterproof below water-level basements and pits under pressure. This is a special chemical mixture of iron and other chemicals that, when mixed with water only, and brushed into the cracks of walls and floors needing repair will permanently waterproof



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D606—Reamer-Type Pilot Bit
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LARGE BITS
for pilot hole drilling and stage enlargement reaming of dewatering, ventilation and escape holes.

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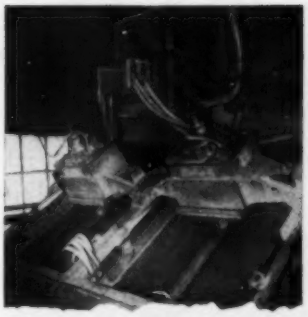

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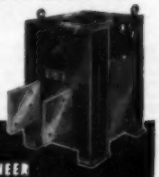

Hanco THE PIONEER ELECTRIC SCREEN HEATER

and stop leaks under all conditions no matter how severe.

"For after-construction waterproofing problems in foundations. Permanently waterproofs concrete, brick, stone, and tile walls and floors from either inside or outside. For all classes of construction where a positive waterproof condition is necessary. Successful under all conditions, no matter how severe."

During a trial before a higher federal court testimony was given as follows: Cyrus Fishburn, a well qualified expert who had been with the Bureau of Standards since 1928, testified as to the results of experiments he conducted with the product. Although he made three applications to a specimen brick wall, each in accordance with directions, nevertheless water seeped through at several points. The permeability tests given by him simulated an exposure of the wall to wind-driven rain. Fishburn testified that the product cannot be considered to be a satisfactory waterproofing for permeable brick masonry walls when applied as directed.

Also, the higher court decided that through the advertising statements, the company represented that its product "effectively seals and waterproofs concrete, brick, stone, stucco, plaster, and masonry surfaces, and makes said surfaces upon which it is applied permanently non-absorbent to water", and that such representations were false.

Therefore the higher court approved the order of the Federal Trade Commission requiring that the company cease and desist making certain representations as to the effectiveness of its products.

Employe Delays Filing Claim

Modern higher courts consistently hold that an injured employee who delays a long period of time in filing a disability claim for compensation under the state workmen's compensation act forfeits his right to compensation.

For illustration, in *Hattabaugh v. B. H. & W. Mining Company*, 230 Pac. (2d) 923, it was shown that on March 29, 1937, an employee was struck in the right eye by a rock thrown by a mechanical drill. He was knocked down and blood ran from his eye. He was treated, in and out of the hospital, by two doctors. He returned to work some two weeks later; but for several additional weeks he wore a patch over his eye. On May 4 the temporary total disability was approved. Nothing further was done until he filed a claim for compensation, eleven years later, when he claimed damage to both eyes as a result of the accidental injury.

The commissioner made an order finding "that the evidence was insufficient to establish that the blind condition of the employee's right eye is the result of said injury of March 29, 1937." The higher court approved the verdict, saying:

"Under these facts and circumstances and considering further that no attempt was made by claimant (employee) to communicate with the employer or make any claim or complaint about an eye condition which he says he had all these years, we hold that the State Industrial

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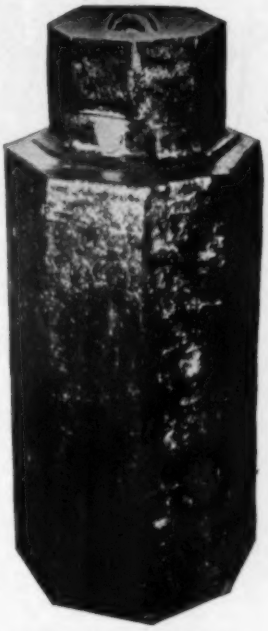

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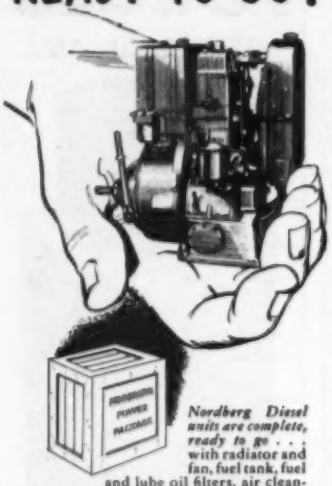

Nordberg Diesel units are complete, ready to go . . . with radiator and fan, fuel tank, fuel and lube oil filters, air cleaner, and starting system. Fill the radiator, crankcase and fuel tank and you're producing reliable, low cost power . . . for power units on shovels, for crane magnets, for pumps in mines, quarries, and irrigation, for petroleum production pumping, for auxiliary generator sets ashore and afloat, for standby lighting units in manufacturing plants—and for hundreds of other power jobs.

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Send catalog covering Nordberg Type 4FS Diesels. I am interested in a unit for the following service: PQ

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4-353

Commission was justified in finding from the review of all the evidence that the disability was not the result of an accidental injury."

Check Is Not Receipt

Most persons have the false belief that a bank check is a valid receipt and that it can be used to prove payment of an account. According to a late higher court decision, this is not so.

For illustration, in *Shock v. Hige*, 140 Fed. (2d) 13, it was shown that a person named Hige sued to recover $935 from a man named Shock, claiming that the latter had paid him only $300 on his accounts. To prove payment Shock introduced before the court a check for $300 endorsed by Hige "in full settlement" of the account. Hige testified that the statement as to settlement was on the check when he endorsed it.

The higher court refused to consider the canceled check as satisfactory evidence that Shock had paid the account in full.

The courts hold that a bank check is not absolute proof of payment because (1) the payor can, if he so desires, write anything on the check after the check is cleared through the bank on which it is drawn, and the cancelled check is returned by the bank to the payor; and (2) no positive proof or evidence can be given that the payee read the restrictions, limitations, or other notations alleged by the payor to have been on the check when it was endorsed by the payee.

Official Is Personally Liable

A higher court rendered an unusual decision holding that an official of a corporation can be held liable personally for damages caused by the corporation.

For illustration, in *Penn v. Penning Quarry Company*, 38 Atl. (2d) 869, it was shown that a land owner leased his quarry and the buildings, tools, and equipment thereon to a corporation.

After expiration of the lease the land owner sued one Gilbert, who it was alleged was in sole and absolute control of the corporation. In the suit the land owner contended that Gilbert, through the corporation, had failed to keep and maintain the buildings, improvements, fixtures, machinery, and equipment in good order and repair, and that he had failed properly to work the premises and care for the equipment, with due regard to the preservation of the premises, as a workable quarry.

Gilbert argued that he could not be held personally liable because he acted for the corporation. However, this higher court said:

"The existence of a corporation should never be allowed to shield an individual who is in control of that legal fiction from the consequences of tortious acts maliciously ordered or directed by him to be done and perpetrated through that instrumentality."

And again see *Luke v. Du Pree*, 158 Ga. 590. Here the higher court held a corporation official personally liable where he induced another to break a contract.

Removing a four-foot core from the corebarrel of a Sprague & Henwood contract drilling rig at an iron ore property in Northern New York.

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from ANY formation

The efficient organization and equipment developed during more than sixty years of successful world-wide experience in contract diamond drilling enable us to obtain a high percentage of core from any rock or ore formation. Unfavorable conditions are overcome, in many cases, through the use of special tools developed by our own engineers and manufactured in our own extensive shops.

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traffic news

CENTRAL TERRITORY RAILROADS
Freight Traffic Committee

Docket 89429 (1)—Proposed to establish on crushed stone and crushed stone screenings, in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from St. Paul, Ind., to Indianapolis, Ind., 75 cents net ton, to meet truck competition.

Docket 89430 (1)—Proposed to establish on stone, fluxing, furnace or foundry, melting or refractory, unburned, in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Durbin, Ohio, to Middletown, Ohio, 172 cents per gross ton.

Docket 89432 (2)—Proposed to establish on crushed stone, in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Rimer, Ohio, to the following points in Michigan:

	Per Net Ton
Battle Creek, Tekonsha, Union city	$2.13
Coldwater, Homer	2.07
Sturgis	1.89

Docket 89440 (1)—Establish on lime, common, hydrated, quick or slaked, carloads, from Ludington, Mich., to Fort Wayne, Ind., mimimum weight 25 tons 24 cents; minimum weight 15 tons 29 cents.

Docket 89468 (1)—Proposed to establish on stone, crushed, carload, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Findlay, Ohio, to Tekonsha, Mich., 201 cents; Union City, Mich., 213 cents; Sherwood, Mich., 213 cents net ton.

Docket 89473 (2)—Proposed to establish on limestone, unburned (not ground or pulverized), in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Narlo and Maple Grove, Ohio, to the following points:

	Per Net Ton
Beebe, Lowell, Macksburg, Toronto, and Wellsville, Ohio	226
Bridgeville and Tippecanoe, Ohio	201
East Canton and Tobosо, Ohio.,	189
Lore City, Pleasant City, and Yellow Creek, Ohio	213

Docket 89475 (2)—Proposed to establish on stone, crushed, in bulk; crushed stone screenings, in bulk; tailings, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Delphos, Ohio, to Glen Jean, Piketon, Teays, and Robbins, Ohio, 213 cents; Gregges, Stockdale, and Wakefield, Ohio, 226 cents.

Docket 89476 (1)—Crushed stone, in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual rate will apply from Osgood, Ind., to Cincinnati, Ohio, 94 cents net ton. Applicable only for B.&O. Railroad delivery. When for delivery on connecting lines, switching charges will be added. To meet motor truck competition. Expires with December 30, 1953.

Docket 89477 (2)—Proposed to establish on stone, crushed, in bulk, crushed stone screenings, in bulk, tailings, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Bluffton to Bunker Hill, Ind. (Naval Air Station), 107 cents; Bennetts, Cassville, and Miami, Ind., 107 cents net ton. To meet motor truck competition and to expire February 28, 1954.

Docket 89487 (2)—Establish on limestone, agricultural, unburned, in bulk, in

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When it comes to really rough screening jobs . . . the screening of damp lime, ag-lime and silica sand at fine mesh . . . the most satisfactory results are obtained by using a Leahy Screen equipped with FlexElex Electric Heating of the screen jacket.

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In addition, the Leahy screen has differential snap action that dislodges intermediate size wedging particles, utilizing an exclusive vibration principle provided by no other screening equipment. The net result is economy that pays for FlexElex in less than a year's time . . . while your profits grow apace as well.

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open-top cars, minimum weight 90 percent of the marked capacity of the car, except that when the car is loaded to cubical or visible capacity, actual weight will apply from Conneaut, Ohio, to Brocton, N. Y., 158 cents; Ripley, N. Y., 146 cents; Van Buren, N. Y., 158 cents net ton.

Docket 89486 (2)—Proposed to establish on stone, crushed stone screenings, in bulk; Tailings, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Monon, Ind., to Bunker Hill, Ind. (Naval Air Station), 107 cents net ton.

GENERAL FREIGHT TRAFFIC COMMITTEE
Eastern Railroads

Bulletin G-7461 (Shipper)—Proposed to establish on limestone, fluxing, carload, in open-top cars, not protected by tarpaulin or other protective coverings, minimum weight 90 percent of marked capacity of car from Beachville and Ingersoll, Ont., to Warren and Youngstown, Ohio, $2.65 per gross ton, not subject to ExParte 175-B increase.

Bulletin G-7464 (Shipper)—Proposed to establish on limestone, ground or pulverized and/or stone dust, carload, minimum weight 30 tons, from Kimballton, Rippleemead, and Pembroke, Va., to P.R.R. stations Ellsworth, Cokeburg, Marianna, and Hills, Pa., $3.95 in open-top equipment and $4.44 in closed equipment, subject to ExParte 175-B increase.

Bulletin G-7547 (Shipper)—Proposed to establish on sand and gravel in all kinds of equipment, carload, minimum 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply, but orders will not be accepted for closed cars of less marked capacity than 60,000 lb. or for open-top cars of less marked capacity than 80,000 lb. from Medina, Ohio, to Two Harbors, Minn., $6.93 per net ton, subject to ExParte 175-B increase.

Docket 89480 (2)—Proposed to establish on crushed stone, in bulk, in open-top cars only, carload, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Chicago and points taking same rates, to Keiser, Ind., 113 cents net ton.

Bulletin G-7602 (Shipper)—Proposed to establish on limestone, natural, ground, unburned, carload, minimum weight 30 tons from Piqua, Ohio, to Marion, N. Y., $3.95 per net ton in open-top cars, $4.44 per net ton in closed cars, subject to ExParte 175-B increase.

Bulletin G-7653 (Shipper)—Proposed to establish on limestone, agricultural, unburned, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of the car, except that when the car is loaded to cubical or visible capacity, actual weight will apply from Conneaut, Ohio, to Brocton, N. Y., and Van Buren, N. Y., $1.58 per net ton; to Ripley, N. Y., $1.46 per net ton, subject to ExParte 175-B.

Bulletin G-7654 (Shipper)—Proposed to establish on calcium or lime, silicate, in multiple-wall paper bags, carload, minimum weight 20 tons from Barberton, Ohio, to Sarina, Ont., 44 cents per hundredweight, subject to ExParte 175-B increase.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-1102-A—Agricultural limestone from Valmeyer and Prairie du Rocher, Ill., to Bloomington, Ill. Proposed as follows: $2.27 from Valmeyer and Prairie du Rocher, Ill., to stations on the G.M.&O. Railroad, Bloomington to Athol, Ill., inclusive. $2.27 from Marlo, Mosher, and Ste. Genevieve, Mo., to Lincoln, Ill. Above rates to apply on agricultural limestone, crushed or ground, in closed cars, subject to X-175-B increase.

Docket IRC 511-1237—Proposed to amend item 240-A of Central Territory Railroad 197-T ICC 4480 to provide for McCook and Bellwood, Ill., to be added as origins in connections with rates on crushed stone as described, in open-top cars to the following destinations in Indiana via I.H.B. N.Y.C. (W): Ade and Schneider 109 cents (applies only for single or two-line hauls); Free, Handy, Sheff, Sloan, Stewart, 117 cents. These rates subject to X-175-B increase.

PACIFIC SOUTH COAST FREIGHT BUREAU

Docket X 3466 (S)—Proposed to establish on rock, silica or ganister, carload, to Curtner, Calif., from Ione, Calif., 13 cents in open or closed cars; to Rogue River, Oreg., 27 cents in open cars and 30 cents in closed cars, minimum 50 tons.

Docket 3473 (S)—Proposed to establish on limestone, pulverized, carload, Hender-

BOTH WORTH LOOKING INTO-

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11% - 13½% Manganese-Nickel Steel
THE TOUGHEST METAL KNOWN—
For Speedy and Low-Cost Replacement of Worn Equipment Parts.

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An organization of skilled craftsmen that you can depend on for sound advice, to save time and money on the repair and rebuilding of heavy equipment.

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11%-13½% Manganese-Nickel Steel
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No Special Tools Required: JUST A HAMMER
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son, Nev., to Southern California points beyond Los Angeles. Request rates based one cent per hundredweight over those to Los Angeles, minimum weight 40 tons.

Docket 3505 (S)—Proposed to establish rate of 41 cents, minimum 50 tons, on lime rock, crude, crushed, ground or powdered, carload, Luning, Nev., to San Diego, Calif.

WEEKLY DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION PROPOSALS

Docket A 13288 (c)—Proposed to establish on limestone, ground or pulverized, unburned, carload, 30 tons, from Cartersville, Ga., to the following points (per net ton):

	Open Cars	Closed Cars
Galax, Va.	$3.83	$4.32
Sparta, Tenn.	$4.31	$4.81

Not subject to X-162-6-8 increases.

Docket A 13340 (c)—Stone, crushed, in closed cars, carload, 40 tons, from Tate and Whitestone, Ga., to the following Illinois points:

	Net Ton
Ashley, Idorado, Junction, Mt. Vernon, and Woodlawn	4.38
Carmi	4.20
Enfield	4.26
Nashville	4.50
Shawneetown, Ill.	4.62
Mt. Vernon, Ill.	3.96

Not subject to X-162-6-8.

Docket A 13389 (c)—Proposed to establish on limestone, ground or powdered, carload, 50 tons, to Pacific Coast and intermediate points from Brownson and Gantt's Quarry, Ala., 1294 cents; Dolcito, Ala., 1283 cents; Tate and Whitestone, Ga., 1338 cents gross ton, not subject to X-162-6-8.

Docket A 13408 (c)—Proposed to establish on limestone, ground or powdered, carload, 50 tons, Sparta, Tenn., to Pacific Coast points, 1319 cents per net ton, subject to X-162-6-8.

Docket A 13433 (c)—Proposed to establish a rate of 145 cents net ton on stone, limestone, granite, or marble, broken or crushed, stone screenings (not applicable when granulated, ground, or pulverized) in open cars, carload, Camak to Grubbs, Ga. Not subject to X-162-6-8.

Docket A 2264—Proposed to establish on crushed stone, carload, described in item 45482-A Southern Freight Tariff Bureau 388-G, Dan to Eanes, Ga., 140 cents net ton, not subject to X-162-6-8.

Docket A 13491 (c)—Proposed to establish on limestone, ground or powdered, carload, 50 tons, Rockwood, Ala., to Pacific Coast and intermediate points, 1294 cents per net ton, not subject to X-162-6-8 increases.

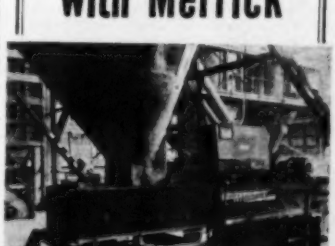
Docket A 9156 (E.R.R. (S) T-SFA 491—Proposed to establish a rate of 44 cents on magnesite, dead burned, carload, 30 tons from Millville, W. Va., to Steelton, Ky. Not subject to X-162-6-8 increases.

FREIGHT TRAFFIC COMMITTEE TRUNK LINE TERRITORY RAILROADS

Trunk Line Territory Railroads

Docket TLM 2645 (Carrier)—Stone, natural (other than bituminous asphalt rock) crushed, in open-top cars, not protected by tarpaulin or other protective covering, carload, minimum weight per note 1 of New York Central Railroad tariff I.C.C. 1299 from West Haverstraw, N. Y., to Ark-

You're Sure with Merrick



FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

Use the Feedoweight

Merrick Scale Mfg. Co.
Passaic, New Jersey

FARREL-BACON JAW CRUSHERS

SIZES 60"x48" to 10"x7"

Optional design features include: (1) Meehanite frame, sectionalized when necessary; (2) removable water-cooled bearings; (3) improved design of swing-jaw bearing; (4) force-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive. *Write for further details or engineering assistance.*

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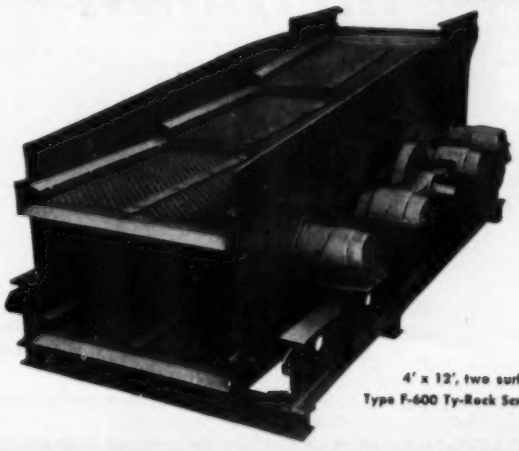
ANSONIA, CONNECTICUT

YOU CAN DEPEND ON

TY-ROCK SCREENS

BALANCED RUGGED



4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

ville, N. Y., $1.50 per net ton, not subject to ExParte 175-B increase, to be issued to meet motor truck and water competition and to expire February 28, 1954.

Docket TLM 2650 (Shipper)—Ganister rock, not ground, in open-top equipment, not protected by tarpaulin or other protective covering, or closed equipment, minimum weight 90 percent of marked capacity of car from Latrobe, Pa., to Chambersburg, Pa., 2.55 net ton in open cars, 3.29 net ton in closed cars. Subject to ExParte 175-B increase.

Docket TL M-2680 (Shipper)—Proposed to establish on ganister rock, not ground, in open-top cars, carload, minimum 90 percent of marked capacity of car, from Rockwood, Pa., to Chambersburg, Pa., $2.51 per net ton, subject to ExParte 175-B.

Docket TL M-2698 (Carrier)—Proposed to publish rates per net ton on ganister rock in bulk, in open-top equipment, without tarpaulin or other protective covering, carload, from Andreas, Pa., to Latrobe, Pa., $3.10 per net ton; to Port Matilda, Pa., $2.55, subject to ExParte 175-B.

WESTERN TRUNK LINE COMMITTEE

Docket E-41-1734—Proposed to establish on perlite rock, broken, crushed or ground, dried or not dried, from Del Norte and South Fork, Colo.

To	Minimum Weight 40 tons	Minimum Weight 50 tons
East St. Louis, Ill. and St. Louis, Mo	550	...
Kansas City, Mo., and Kansas City, Kan.	480	...
Chicago, Ill.	616	586

Rates in cents per ton of 2,000 lb.

Docket E 158-111 (C)—Slag, crushed, ground or pulverized, in bulk or in packages, in closed cars, carload, minimum weight marked capacity of car, but not less than 40 tons. Chicago, Ill., to Winnipeg, Man., $7.60 per net ton of 2,000 lb., subject to X-175-B increase.

Docket E-41-1741 (S)—Proposed to establish on crushed stone, in bags, in closed cars, minimum weight 30 tons, from Wausau, Wis., to the following points in cents per net ton: Portland, Ind., Indianapolis, Ind., 490. Subject to X-175-B increase.

Docket X-E-41-1743 (S)—Sand, gravel, stone, broken, crushed or ground or rip rap, as more fully described in item 15-A of Western Trunk Line Freight Tariff 209-E, in open-top cars, not protected by tarpaulin or other protective covering, from Crampton Spur, S. D., to Yankton, S. D., 133 cents per net ton, not subject to X-175-B increase.

Docket X-E 1727 (S)—Proposed to establish on stone, broken, crushed, or ground, in open-top equipment, carload, minimum weight 90 percent of marked capacity of car except that when car is loaded to full cubical or visible capacity, actual weight will apply from Huntington, Mo., to New Berlin, Ill. (distance, 100.5 miles), 92 cents net ton, subject to ExParte 175-B.

Docket E-158-110 (S)—Proposed to establish a rate of $7.00 per net ton on granulated slag, in bulk, in open cars, minimum weight 90 percent of marked capacity of car from Denver, Colo., to Huntington, Ind., subject to X-175-B.

Docket E-41-1730 (S)—Proposed to establish on sand, gravel, and crushed stone (except rip-rap or rubble), minimum weight 90 percent of marked capacity of car, except that when weight of shipment loaded to full visible capacity of car is less than 90 percent of marked capacity, actual weight will apply. In no case will orders be accepted for cars less than 30 tons marked capacity from Lithonia, Tate, and Whitestone, Ga., to Nebraska destinations on Union Pacific Railroad shown on Exhibit. Establish through one-factor rates in cents per ton of 2,000 lb. Representative Nebraska points shown below:

To	Closed Car
David City	745
Rogers	733
Norfolk	764
Grand Island	767
Hastings	751
Kearney	778
North Platte	837

SOUTHWESTERN FREIGHT BUREAU

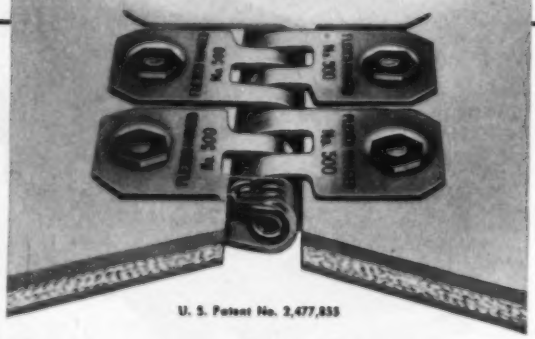
Docket 63439 (S)—Proposed to establish rate of 54 cents on Stone, Mt. Airy, N. C., to Kansas City, Mo., minimum 50 tons, not subject to X-162-6-8 increase.

Docket 63643 (S)—Establish following rates on gypsum or gypsum rock, Sweetwater, Tex., to New Mexico, minimum weight 25 tons or 90 percent of the marked capacity of car, whichever is greater, from Sweetwater, Tex., to the following stations in New Mexico.

	Open Cars	Closed Cars
Berino, Mesquite, Vade	4.10	4.43
Dona Anna, Hill, Las Cruces, Leasburg, Mesilla Park, Ft. Selden, Tonuco, Rincon	4.32	4.64

Not subject to X-162-6-8 increases.

... the new separable
FLEXCO HINGED
BELT FASTENERS



U. S. Patent No. 2,477,835

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts 3/16" to 1/2" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

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IT COSTS NO MORE TO USE THE BEST

REPLACE WITH
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MANGANESE STEEL
Shovel Dippers
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ESTABLISHED 1881

WHATEVER YOU HAUL

MORE with GarWood

If "pull" is your problem, a Gar Wood winch is the answer. Gar Wood winches are tougher . . . last longer . . . are safer to operate . . . require less maintenance. Self-energizing, automatic safety brake stops and holds any load up to winch capacity yet releases fully without drag. Write for information today.

It's True! Whatever you haul, you can haul more in Gar Wood Bodies *without exceeding legal load limits.* Gar Wood Bodies and Hoists are designed and built to eliminate dead weight without affecting vital strength and rigidity. This combination of minimum weight with maximum strength and rigidity assures extra payload—and extra profits—on every trip.

Box-type tailgate construction, forged steel tailgate pins and hooks, plus horizontal box bracing save dead weight yet put extra strength where it is needed to withstand load concentrations when dumping or spreading. Rear corner posts are extra strong to withstand shock loads and maintain permanent alignment. Rear apron is welded solidly to the corner posts for maximum rigidity. Body panels are reinforced with V-type braces to add extra strength without excessive weight.

There's a Gar Wood Body and Hoist Combination in every type and capacity to meet your every operating requirement. Find out today how you can *put more pay in your payloads* by putting Gar Wood Bodies and Hoists to work on your hauling job. Mail the coupon below NOW!

Gar Wood Industries, Inc.
34012 Main St., Wayne, Mich.
Att'n: Customer Service Dept.

Please tell me how I can increase operating revenues by using Gar Wood Bodies and Hoists.

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TRUCK EQUIPMENT: Dump Truck Bodies and Hoists, Winches and Cranes, Refuse Collection Bodies, Elevating End Gates
CONSTRUCTION EQUIPMENT: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Finegraders, Truck-Mounted Road Graders

TAKE THE GUESSWORK

out of your truck buying

Owner-Proved For Lowest Total Cost. New International Model R-212 for off-highway jobs. Famous 162-horsepower Red Diamond valve-in-head engine. GVW rating 36,000 lbs. Wheelbases 157 to 211 inches.

International Trucks are proved all 3 ways

You take the guesswork out of truck buying when you buy International trucks. They are proved all three ways to give you the performance you want at the *lowest* cost:

1. **Proved Before They're Built.** Before any International truck model goes into production, the right balance between design, costs, and performance is developed and proved at International Harvester's new truck Engineering Laboratory. The results—longer truck life, reduced operating and maintenance cost—give you more truck for your dollar.

2. **Proved After They're Built.** Economy, performance, and stamina of Internationals is proved again at the "Desert Whipping Post," 4000-acre Proving Ground in Arizona, under the most difficult operating conditions.

3. **Proved In Service.** In 1952, America's most cost-conscious truck operators bought 58% more heavy-duty Internationals than any other make, 27.3% of all heavy-duty trucks sold. Every new International truck, from ½-ton pickups to six-wheel off-highway models, embodies the advanced engineering principles that have kept Internationals the heavy-duty sales leader for 21 straight years.

See them. Compare them. Drive them. Ask your nearest International Dealer or Branch for all the facts.

Select the International That's Right for Your Job from America's Most Complete Truck Line. 168 basic models from ½-ton to 90,000 lbs. GVW rating . . . 307 new features . . . 29 engines, with widest practical choice of gasoline, LPG or diesel power, available to give the right power for the job . . . 296 wheelbases . . . Transmissions and axle ratios to meet any requirement . . . Thousands of variations for exact job specialization.

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International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL TRUCKS

Standard of the Highway

8 months extra service with the right brick!

THE superiority of Permanente Periclase-Chrome brick—the brick on the right—is demonstrated by its performance in rotary cement kilns in five plants selected at random from our customer list.

The brick on the left, previously used in the hot zone linings, gave approximately 2 months average service. With Permanente Periclase-Chrome brick, the average service jumped to 10 months!

This eight months extra service increased annual capacity an average of 12,935 barrels per kiln. Annual net profits went up an average of $3,880. In addition, important savings were realized through reduced cost of materials for relining.

Whatever *your* current kiln capacity, it probably can be increased with Permanente Periclase-Chrome brick, because they are *especially designed* for hot zone linings. If an appraisal of your kiln performance would be helpful, Kaiser Chemicals will be glad to work with you.

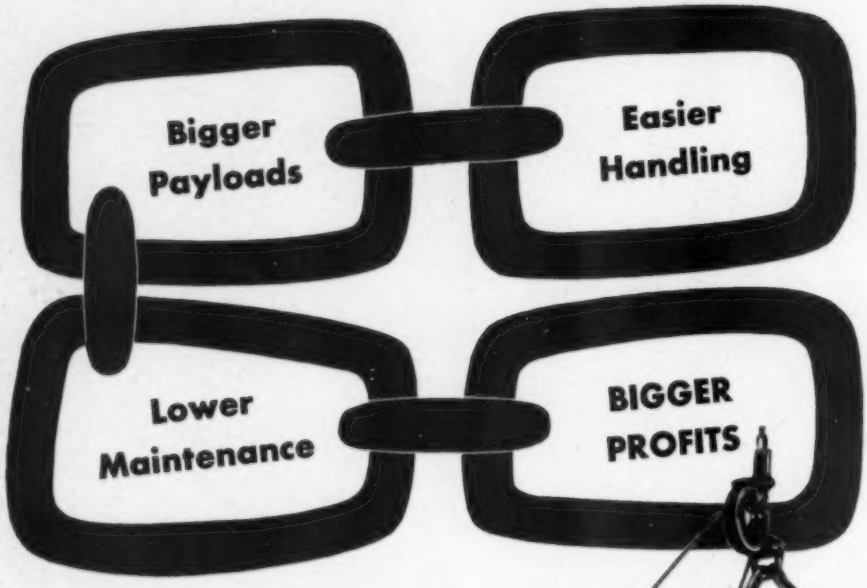
SEND FOR BOOKLET giving installation procedures and for literature explaining all the advantages of Permanente Periclase-Chrome bricks. Standard brick sizes available, both burned and chemically bonded. Installation service at no extra cost. Complete facilities insure superior service. Call or write principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

Kaiser Chemicals

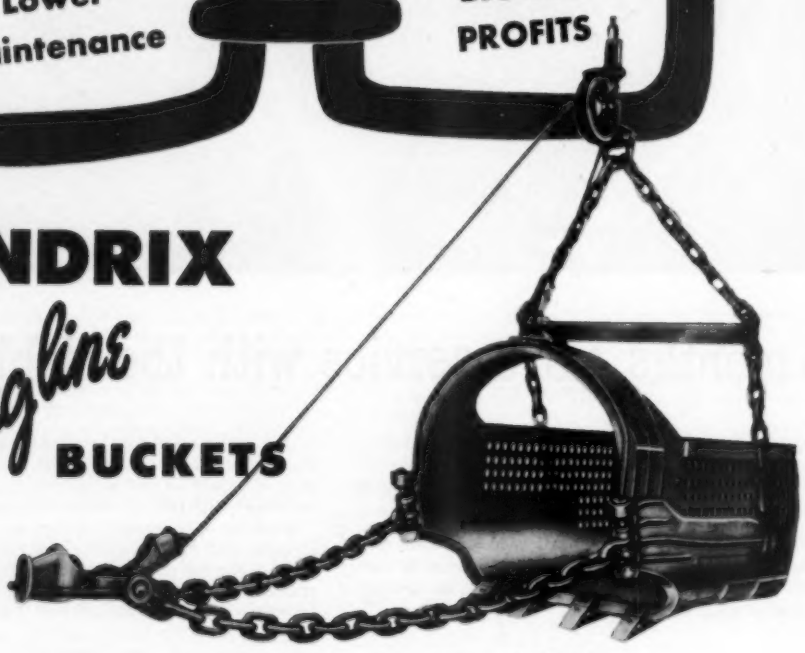
Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

OPERATION Chain Action...



HENDRIX *Dragline* BUCKETS



3/8 to 40 Cu. Yds.

A TYPE & SIZE FOR EVERY DIGGING PURPOSE

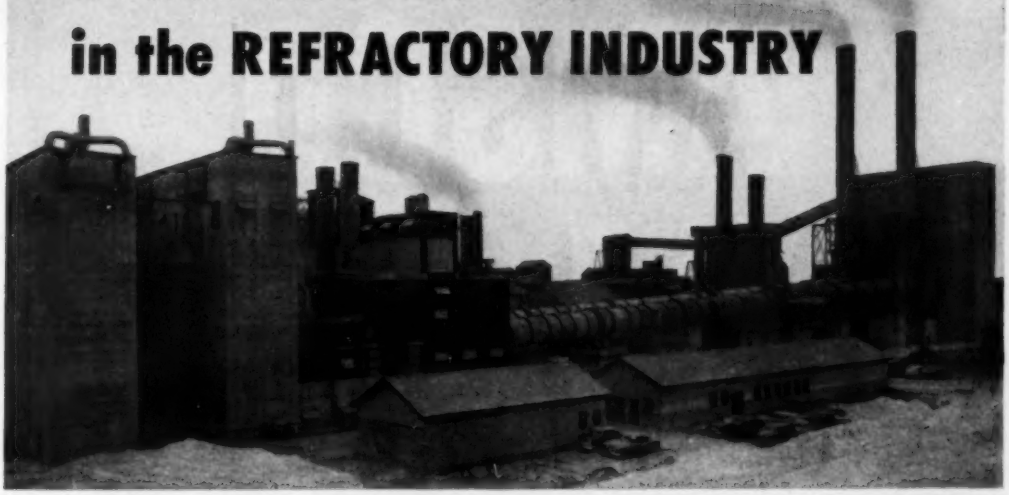
HENDRIX *Lightweight* DRAGLINE BUCKETS

Hendrix Buckets Also Available Without Perforations On Special Order Only

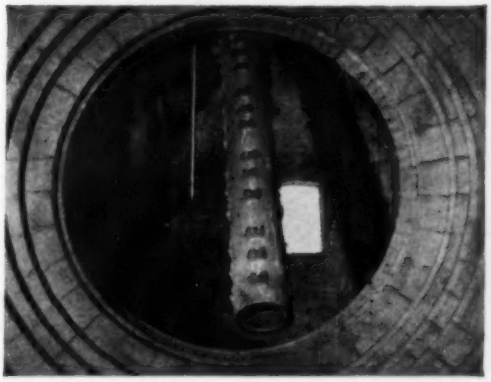
HENDRIX MANUFACTURING CO., INC.

MANSFIELD — LOUISIANA

THERMALLOY*at work... in the REFRACTORY INDUSTRY



This is the new home of the largest rotary kilns in the refractory industry . . . recently completed by Basic Refractories, Inc., in Maple Grove, Ohio. Measuring 11'3" in diameter by 390' long, each kiln daily processes approximately 2000 tons of granular dolomitic refractories for open-hearth and electric, steel-furnace linings. With continuous operation in this plant, equipment must give top performance, with minimum down time. Shown below are two important parts in Basic's production equipment . . . both made from high-heat and abrasion-resistant Thermalloy. Their design was achieved by co-operation between Electro-Alloys' and Basic's engineers. The same engineering help is available to you at Electro-Alloys.



Thermalloy Kiln Feed Pipe . . . The outside shell of the pipe must resist warping at temperatures up to 1700°F. in the dust collector chamber. The interior lining must resist the abrasive action of dolomite tumbling continually into the kiln. Both jobs are successfully done by selected grades of Thermalloy.

Thermalloy Damper . . . The sectional design of this high heat-resistant Thermalloy damper offers several cost-saving advantages in comparison to heavier refractory dampers formerly used: installation and handling are easier; damper sections can be replaced and repaired faster; draft control can be maintained more effectively.

Put Heat-Resistant Thermalloy to Work in Your Plant . . .
call or write

*Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

AMSCO V-MANG

The new moly-manganese electrode that's better than nickel-manganese rods for build-up and repair

- TOUGHER DEPOSIT
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THE RIGHT WAY TO SAY HARDFACING

AMERICAN Brake Shoe COMPANY

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. . . "the rolls take a beating on this job!"

a report from

J. V. GLEASON

J.V. Gleason Co., Bituminous Contractors of St. Louis Park, Minn.

on their "66"

DIAMOND ROTOR-LIFT PLANT

BITUMINOUS SURFACING

J. V. GLEASON

3701 LOUISIANA AVENUE, ST. LOUIS PARK, MINNESOTA

DIAMOND IRON WORKS, INC.
1710 N. 2nd Street
Minneapolis 11, Minn.
Attn. C. E. Hanson, Vice President Charge of Sales

Dear Carl:

Direct from a year's operation in a state pit located near Lonsdale in Southern Minnesota, our Diamond "66" has yet to see downtime, through parts failure. Now it is crushing a steady 150 y.p.h. of 2½" crush specification material at a site where the going is heavy and the strain is really on the 30" x 18" roll crusher. And we have seen no downtime yet. The plant's 10" x 36" jaw crusher and 4' x 10' — 2 deck vibrator screen are helping to keep our "66" producing day after day.

We'll stick with Diamond plants for a lot of reasons, the chief being that they can take it when the going is rough.

Very sincerely yours,
J. V. Gleason, Owner

ABOVE: Loading pit-run at 150 y.p.h. Power unit installed over delivery conveyor need not be removed when on road.

BELOW: Dumping pit-run into Diamond shovel-loading hopper. A Diamond grizzly and single eccentric plate feeder keep a continuous, regulated feed.

Everything . . . for the aggregate producer

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
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EASY HANDLING AND FILLING

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CHASE Multiwall Bags

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for the packaging, shipping
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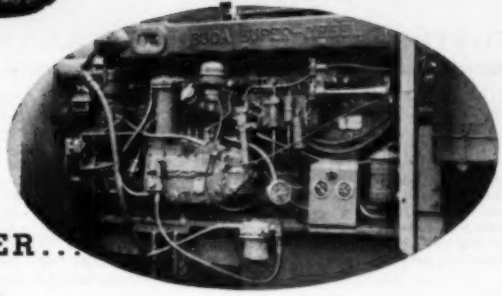
30 BRANCHES AND SALES OFFICES STRATEGICALLY LOCATED

BUDA DIESELS
POWER WORLD'S LARGEST TRUCK*

*Based on total tire capacity less net weight.

Model 600 Dart — 60 Ton Capacity. Powered by two Buda 8 DAS-1125 Super Diesels



One of two Buda Super Diesels powering new Dart 600.

BAGDAD COPPER *Again* PICKS BUDA DIESELS FOR *BIG* POWER... STAMINA...LONG LIFE!

Buda Diesels' superiority was demonstrated again when Bagdad Copper Mines picked two 8 DAS-1125 Super Diesels to power their new Dart 600 truck — called the largest truck in the world.

Deep, open pit mines are tough proving grounds for engines. The Buda Diesels powering other Bagdad haulage units are delivering such stand-out performance that Buda was the natural power choice for this giant new truck.

Your nearby Buda Distributor can show you how Buda Diesels will increase your equipment performance and profits. Ask him today. Write for Bulletins and data. The Buda Company, Harvey, Illinois.

BUDA

a Power-Full and Dependable Name in Engines

BC-32

Have you a dust recovery problem?

Bring it to WESTERN PRECIPITATION

... The Only Organization With Years Of "Know-How" In BOTH *Electrical* And *Mechanical* Recovery Methods!

If you have any kind of a suspension-recovery problem—whether dust, fly ash, fume, fog or mists—it will pay you to bring it to the leading organization in the field ... WESTERN PRECIPITATION CORPORATION. Western Precipitation not only pioneered, over 44 years ago, the first commercial application of the now-famous COTTRELL Electrical Precipitators, but also has been a leader for many years in the *mechanical* recovery field with its widely-accepted MULTICLONE Collectors.

Result:

Western Precipitation is unsurpassed in the all-important factor of "know-how" in BOTH the electrical and mechanical fields ... knows from years of first-hand experience whether your particular problem can best be solved by mechanical or electrical methods—*or by a combination of the two* ... can give you a direct and unbiased recommendation on the matter ... and then can provide the complete installation under *one* responsibility, *one* overall performance guarantee, even where Combination Multiclone-Precipitator (CMP) installations are made!

Western Precipitation products and services include ...

COTTRELL

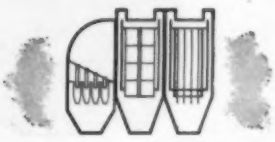
Electrical Precipitators

... the most efficient recovery equipment for high recovery, long life, low maintenance on practically any type of suspensions, wet or dry. COTTRELLS can be designed to handle a few c.f.m. —or millions—with equal ease, and at virtually any operating temperature. Recovery efficiencies closely approach 100% recovery, if desired, with very low draft loss, minimum power costs and negligible labor costs. *By all standards, Western Precipitation* COTTRELLS *give highest recovery at lowest cost per-year-of-service!*

MULTICLONE

Mechanical Collectors

... the most efficient, most compact, most trouble-free mechanical equipment for recovering suspensions from gases. Because of their unique small-tube design, MULTICLONES are unsurpassed in mechanical recovery efficiencies—require less space, less maintenance, and are far simpler to install. No filters or screens to replace, nothing to burn or cause fire hazards, no high speed moving parts to repair or replace. These and many other advantages make MULTICLONE Collectors the logical choice on installations where mechanical recovery is selected.



CMP UNITS

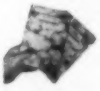
(Combination Multiclone-Precipitator)

... combine, in *one* compact installation, *both* mechanical and electrical recovery principles so that maximum benefit is obtained from the advantages inherent in each method. The MULTICLONE section centrifugally removes the larger and heavier suspensions (down to a few microns in diameter) ... and the COTTRELL section then electrically removes the very small particles remaining in the gases. Thus, the bulk of the recovery is obtained with relatively low-cost equipment, and the final clean-up is obtained with equipment having unusually high recovery efficiency—approaching theoretically perfect, if desired.

The recovery of suspensions from gases is a highly exact science and every problem is different. Some require mechanical methods—others electrical methods—still others a combination of mechanical and electrical methods in proper balance to meet the individual requirements of each application. No matter what your problem, remember that only Western Precipitation has had years of field experience in BOTH mechanical and electrical methods!

Let our experienced engineers study your recovery requirements and make an unbiased recommendation on the equipment best suited to your particular problem. A wire, phone call or letter to our nearest office places this unique "know-how" at your service, without obligation.

Send for descriptive literature!



WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
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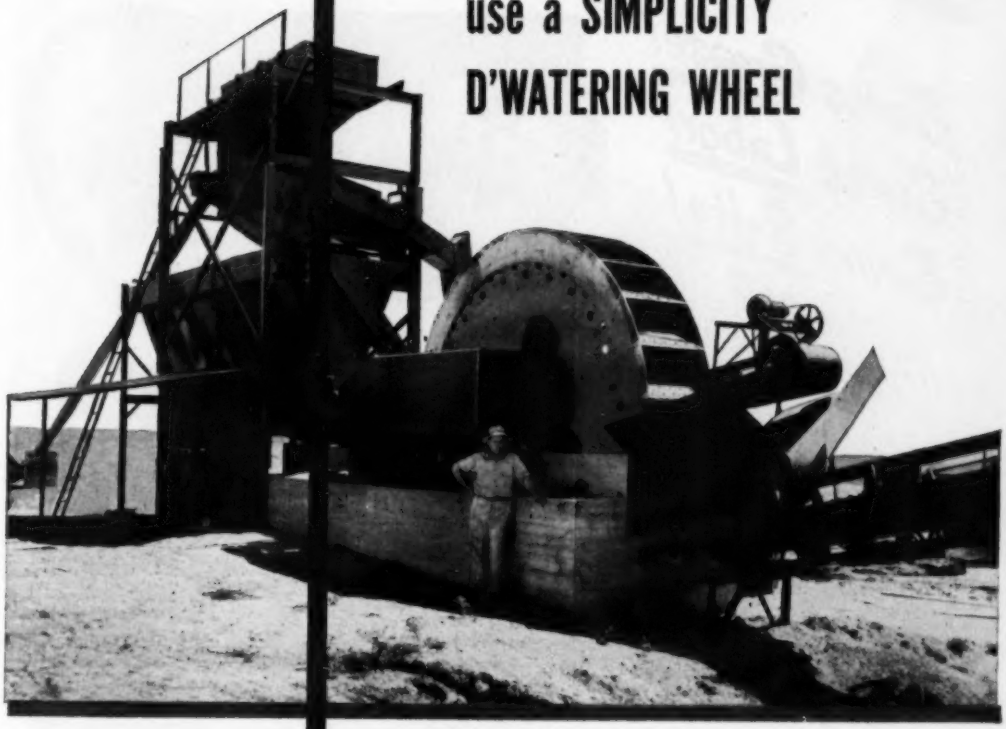
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

MULTICLONE—T.M. Reg.

There's no cheaper method of dewatering sand or gravel . . . use a SIMPLICITY D'WATERING WHEEL



In the installation shown here, a Simplicity D'Watering Wheel is teamed up with a Double Deck Simplicity Gyrating Screen to provide fast, low-cost sizing, separating and dewatering of sand and gravel. The screen separates the gravel from the sand and deposits sand in the tank of the D'Watering Wheel. Then the Wheel lifts the sand from the tank, reducing the moisture content to 12% in the process, and delivers it to a fast-moving inclined conveyor belt. One simple power unit is all that is necessary. Maintenance and operating costs are virtually eliminated, thus making the Simplicity D'Watering Wheel more economical than any other device for dewatering sand and gravel. Simplicity D'Watering Wheels are available in 2' and 3' widths with 14' diameters. For more information about this economical equipment, consult a Simplicity sales engineer or write us today.

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.

FOR CANADA: Canadian Bridge Engineering Co., Ltd., Walkerville, Ontario

FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, N.Y.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND, MICHIGAN

NEW UST* Continental Idlers

*** UNIT-SEALED PRE-LUBRICATED TIMKEN BEARINGS**

Saves Grease!
Saves Labor!
Saves Belts!

STANDARD DUTY IDLER

UNIT-SEALED
PRE-LUBRICATED
TIMKEN BEARINGS

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

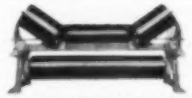
The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellent grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler without relubrication for 1-2-3 years depending upon the severity or character of conditions.

Write for Bulletin P.Q.-116

SELF-ALIGNING FLAT BELT IDLER

RUBBER DISC IMPACT IDLER



GRAIN CONCENTRATION IDLER

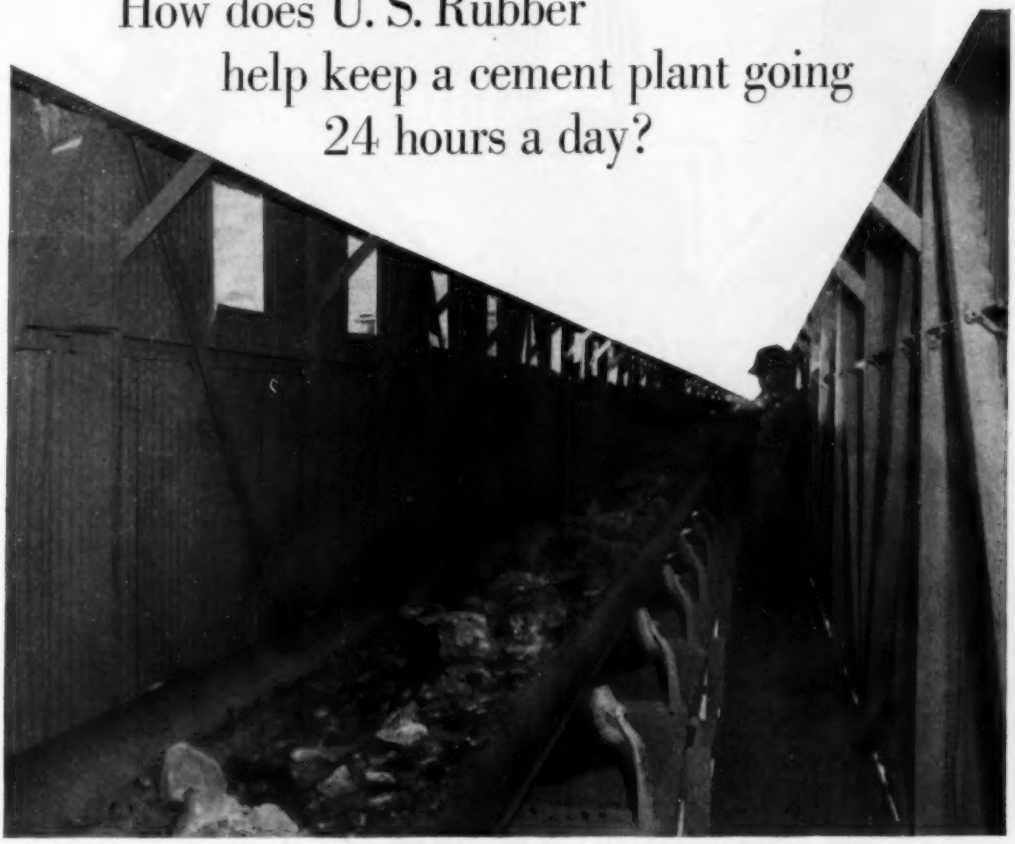
SELF-ALIGNING TROUGHING IDLER

Long Life- THE ULTIMATE IN MINIMUM MAINTENANCE

CG—5209

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA
ENGINEERS · ATLANTA · DALLAS · MEMPHIS · NEW YORK · MANUFACTURERS

How does U. S. Rubber help keep a cement plant going 24 hours a day?



U. S. Rubber engineer inspecting belt. Inspection is a part of U. S. Rubber's continuous-servicing policy. View is looking down gallery to primary crusher.

(left) Overall view of cement plant, showing belt galleries connecting primary crusher plant (at right) with transfer house and mill.

PRODUCT OF

U.S. RUBBER
SERVING THROUGH SCIENCE

U.S. Rubber conveyor belts are the lifeline of the plant. They help maintain the uninterrupted operation that is essential for the plant's economical production. These belts, as they carry the limestone from the pit to the kilns, withstand the abrasive action of the limestone all around the clock, seven days a week, handling 600 tons per hour.

"U.S." has always been a leader in materials handling. It will pay you to consult "U.S." engineers when you have a problem. Write to address below.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

WEAR-ARC hard-facing alloys correct it!

WEAR-ARC WH • Build-up alloy for manganese and high carbon steel parts subjected to severe impact, abrasion, and compression.

WEAR-ARC 12 • Hard-facing alloy for overlays providing exceptional wear resistance under heavy impact and abrasion conditions, and deposits to bond with manganese steel.

Singly or in combination, one or more of the many **Wear-Arc** hard-facing alloy electrodes will handle every known rebuilding and hard-facing problem. Why experiment . . . why depend on the unknown, the untested? For every application where wear patterns must be corrected to resist impact, abrasion, compression, heat, and corrosion . . . insist on genuine **Wear-Arc** Electrodes, one of Alloy Rods Company's six famous brands!

ALLOY RODS COMPANY
YORK, PENNSYLVANIA

NO FINER ELECTRODES MADE . . . ANYWHERE

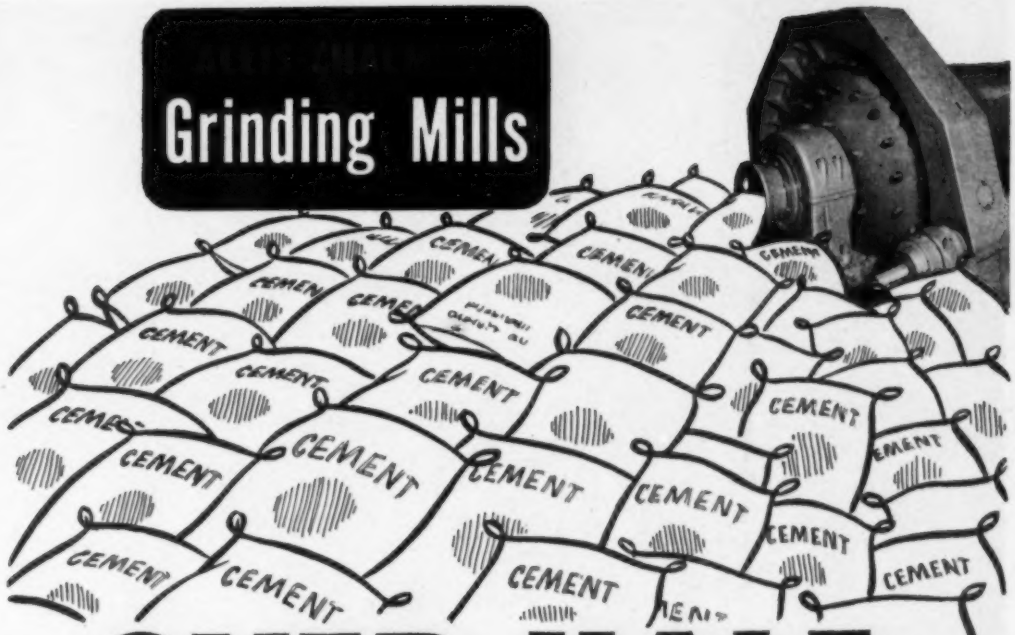
Manufacturers of Arcaloy stainless steel electrodes • Bronze-Arc phosphor bronze electrodes • Nickel-Arc and Nickel-Arc 60 electrodes for cast iron • Tool-Arc electrodes for tools and dies • Weld-Arc low hydrogen electrodes. Write for product Bulletins.

Wear-Arc 3 to build up carbon steel . . Wear-Arc 6 for heavy impact, abrasion, and compression . . . Wear-Arc 40 and Wear-Flame 40 for light impact and severe abrasion . . . Wear-Arc A and Wear-Flame A cobalt-chromium-tungsten type for light impact, wear resistance, heat, and corrosion . . . Wear-Arc B and Wear-Flame B cobalt-chromium-tungsten type for heat, corrosion, and abrasion combined with impact . . Wear-Arc and Wear-Flame Tungsten Carbide the ultimate in abrasion resistance.

AR-14.

EDUCATIONAL FILM • Alloy Rods full color and sound motion picture, "No Finer Electrodes Made . . . Anywhere," 16 mm., available without charge . . . see how electrodes are made . . . write Department M.

Grinding Mills



OVER HALF

of all Cement produced in the U.S. is Ground in Allis-Chalmers Grinding Mills!

CEMENT PRODUCERS specify Allis-Chalmers grinding mills because they have proved so profitable on the job. In fact, *7 out of 10* A-C mills sold today are repeat orders!

When you specify Allis-Chalmers grinding mills you profit by A-C's *unsurpassed* experience, engineering, testing, erection and parts service. You can be sure of getting the right size and type mill for your job. A-C has built over 4300 grinding mills covering every type of application.

Get more facts from the A-C representative in your area. And write Allis-Chalmers, Milwaukee 1, Wisconsin, for Grinding Mill Bulletin 07B6718A.

A-3996

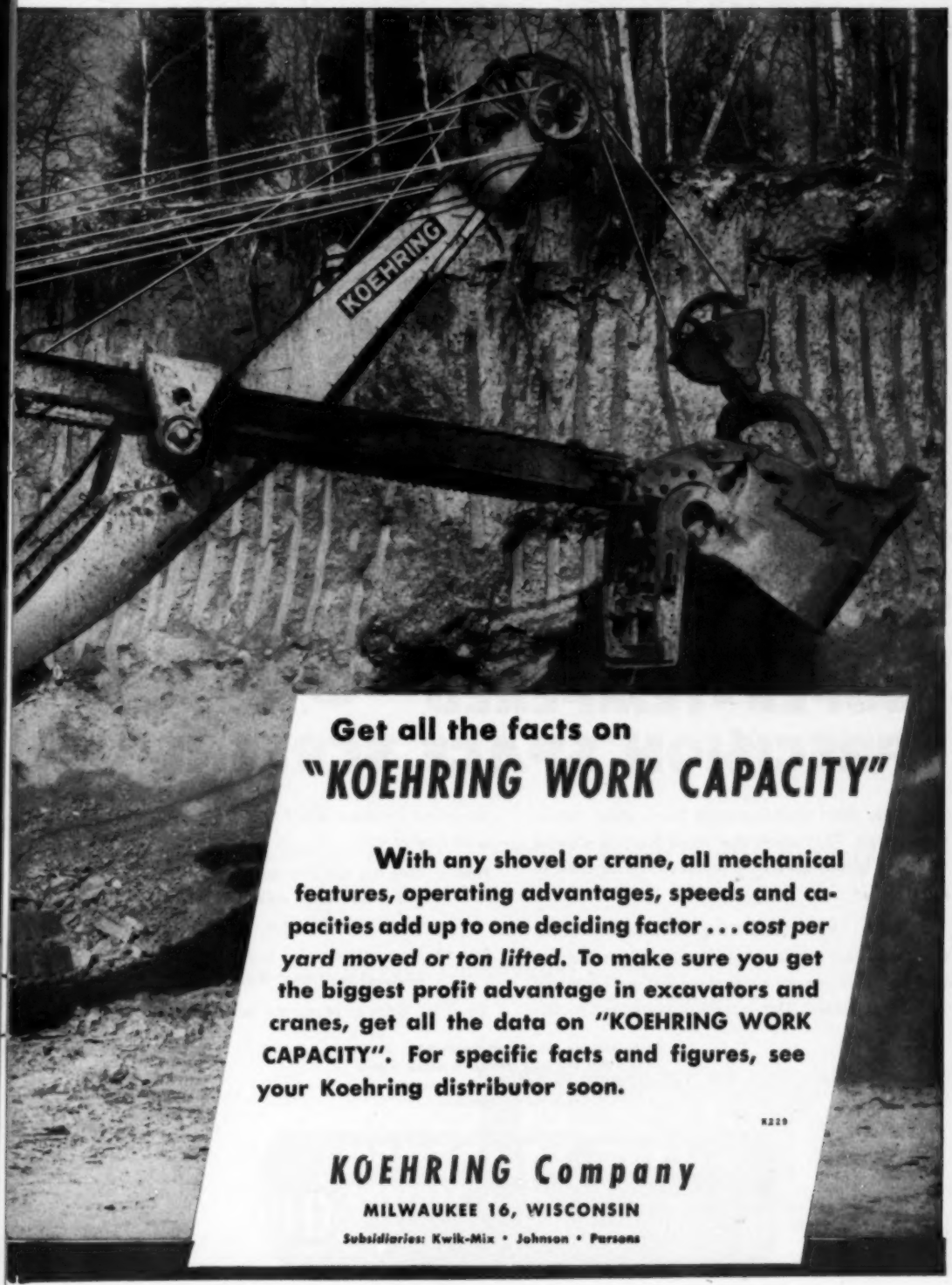
ALLIS-CHALMERS

A-C builds single and multi-stage grinding mills in a complete range of sizes. Special mill modifications and grinding circuits can be engineered to suit your application.

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Vibrating Screens | Jaw Crushers | Gyratory Crushers | Hammermills | Kilns, Coolers, Dryers

KOEHRING
HEAVY DUTY



Get all the facts on
"KOEHRING WORK CAPACITY"

With any shovel or crane, all mechanical features, operating advantages, speeds and capacities add up to one deciding factor . . . *cost per yard moved or ton lifted.* To make sure you get the biggest profit advantage in excavators and cranes, get all the data on "KOEHRING WORK CAPACITY". For specific facts and figures, see your Koehring distributor soon.

K229

KOEHRING Company

MILWAUKEE 16, WISCONSIN

Subsidiaries: Kwik-Mix • Johnson • Parsons

"let's knock off, boys...

these are SUPER-TEMPERED PRECISION SPACE SCREENS"

Yes, these three trouble-makers know when they've had enough. They know that when Super-Tempered Precision Screens go on the job, it's time for them to hit the road.

Abrasion... Vibration... Fatigue—these are destructive forces that can upset your production schedules, cost you plenty in more downtime and more frequent screen replacement. But—not when you install Super-Tempered Precision Space Screens. And here are two good reasons why:

First: They stay tight because they're precision crimped and woven extra tightly on powerful hydraulic looms.

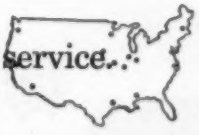
Second: They resist abrasion and fatigue because they're made of hard and tough super-tempered steel.

To order, write or phone our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta, Boston, Buffalo, Chicago
Detroit, New York, Philadelphia

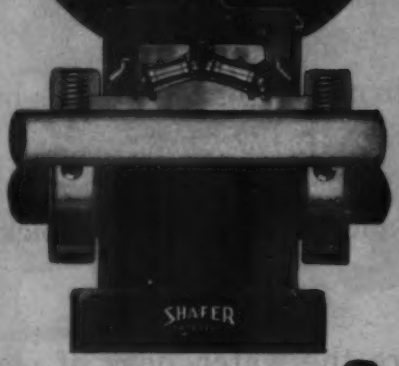
SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CF&I

Here's Why Bemis is Your Best Multiwall Paper Bag Source...

Since 1858, Bemis has SPECIALIZED in making bags. Bemis buys immense quantities of kraft paper and so can get the "pick of the crop." Bemis laboratories are the watch dogs of paper quality. Bemis engineers work constantly on new and better bags for diversified products. Bemis' twelve multiwall plants are strategically located to give unexcelled service... 

Bemis

THE *Rugged* JOBS ARE "*Routine*" FOR SHAFER BEARINGS



Throughout the land Shafer Roller Bearings are increasing the nation's productive capacity—carrying big loads, saving money and power, reducing down time and maintenance costs wherever America's heaviest duty power transmission equipment is at work.

Shafer Bearings handle these tough jobs better because they are engineered to-the-job—to provide longer life, greater dependability and lower operating costs under the severest working conditions. Integrally self-aligned, they have full radial-thrust and greater reserve shock load capacities under all conditions of misalignment; are equipped with self-centering "Z" housing seals and Micro-Lock 12-point adjustment. See the Shafer bearing specialist near you . . . or write us direct . . . for complete information and engineering consul on a no-obligation basis. SHAFER BEARING CORPORATION, 801 Burlington Avenue, Downers Grove, Illinois.

Pillow Blocks

Flange Units

Flange Cartridge Units

Cartridge Units

Duplex Units

Take-Up Units

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SHAFER

SELF-ALIGNING

ROLLER BEARINGS

Take-Up and Frame Units

Aircraft Control Bearings

NO SCOOPING

NO SEWING

NO TIEING

CUT BAG PACKING COSTS

AUGER-MATIC

Bag Packer

Quickly fills self-closing bags to the desired weight. Saves time in filling and eliminates need for sewing or other expensive bag closing equipment.

The AUGER-MATIC Bag Packer has a multi-twist auger which can quickly be changed to pack any material from powder to pellets.

AUGER-MATIC Packing reduces dirt and waste . . . a time and labor saver. Packer can easily be moved from one filling point to another.

Send for descriptive literature.

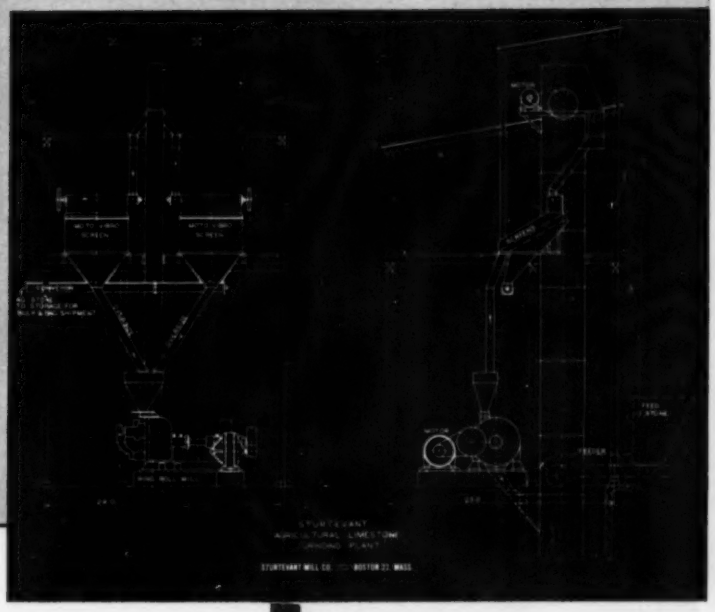
E. D. CODDINGTON MFG. CO.

5074 NORTH 37TH STREET • MILWAUKEE 9, WISCONSIN

STURTEVANT RING ROLL MILLS

GIVE YOU

Finer Grinding of AG-LIME



You Get . . .

HIGH TONNAGE

Use Less HP Per Ton . . .

Lower Maintenance Cost

Sturtevant Ring Roll Mills provide the solution to fine grinding of agricultural limestone which is taking the place of the coarser mesh previously made.

These rugged, dependable mills overcome the disadvantages of hammer mills, which cannot be closed up enough to get the required fineness.

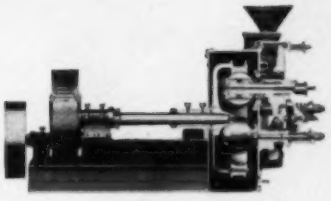
The Ring Roll Mills give you more over-all fineness, more flour than possible by any other grinding method. Maintenance costs are cut to the bone especially where silica is present which quickly wears down hammer mills.

Investigate Sturtevant Ring Roll Mills and screens today. Find out how you can increase tonnage, reduce cost of grinding fine ag-lime. Write for information.

STURTEVANT MILL COMPANY

104 CLAYTON STREET

BOSTON 22, MASSACHUSETTS

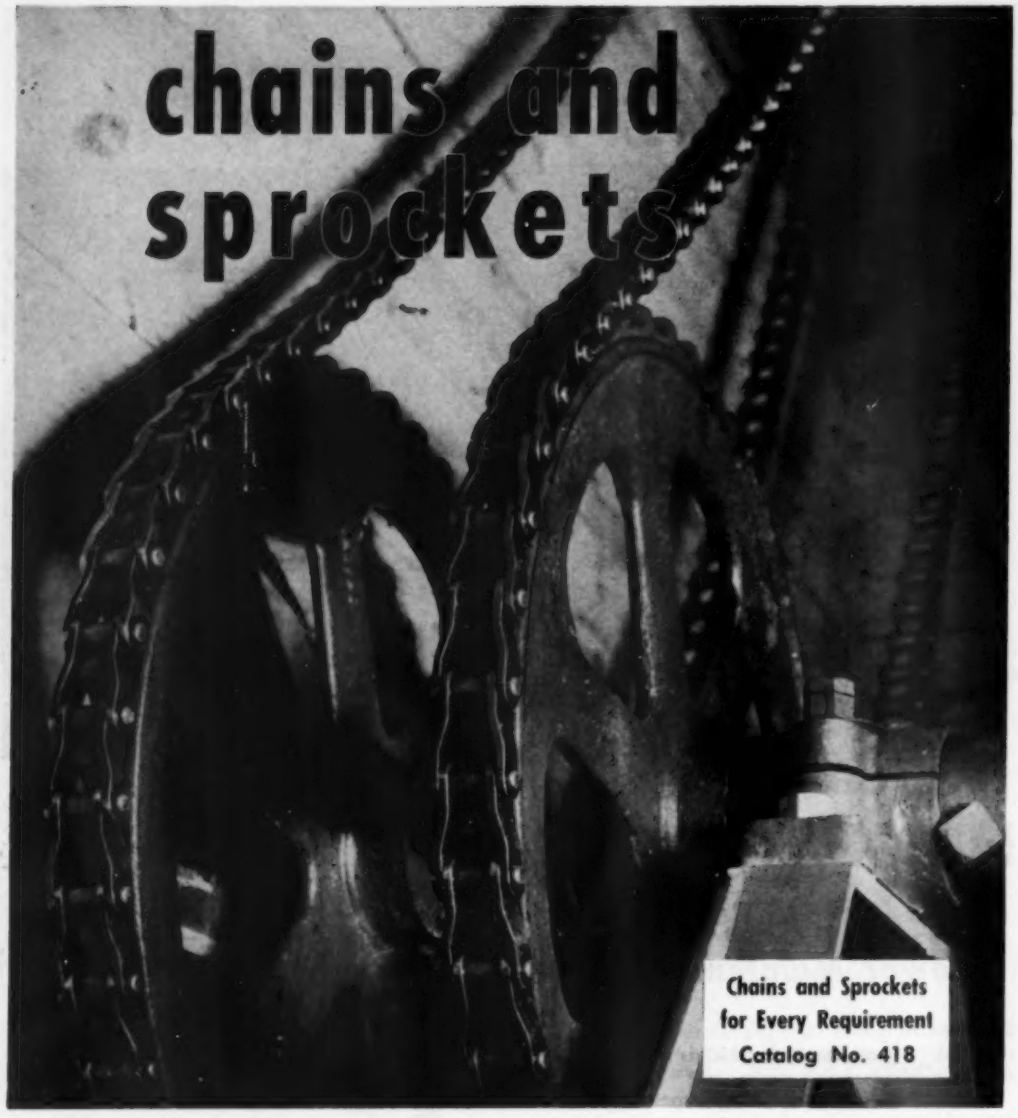


RING ROLL MILL

for fine reduction of ag-lime (4 to 20 mesh). Open-door accessibility for easy cleaning. Available in many sizes and capacities.

MOTO-VIBRO SCREENS

models with or without feeders. Many types and sizes . . . screens from ½" to 60 mesh.



THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

May, 1953

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT & QUARRY

Pneumatically operated discharger door

75 cu. ft. BIGGER PROFITS with a BIGGER MIXER!

ANOTHER GOCORP FIRST

Producing lightweight blocks? If you're using a modern high production block machine, we'll bet your mixer operator is having trouble keeping up. Authorities agree lightweight aggregates require more mixing time. Unless you sacrifice quality you lose production and PROFITS.

The GOCORP 75 cu. ft. Batch Mixer solves this problem completely. The additional capacity permits the needed extra mixing time for your block machine to run at full speed. Once again, the people at GOCORP recognized a problem in the industry and came up with the answer.

The big "75" will be right at home in the spot now occupied by your 42 or 50. No increase in height.

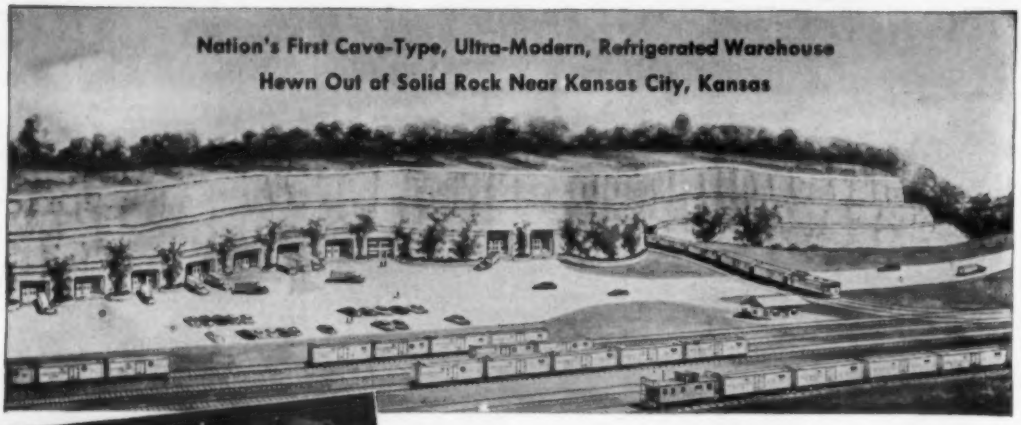
Of course, the 75 cu. ft. Mixer has the same outstanding features as the other GOCORP Mixers—*GOHARD sectional liners . . . GOHARD ribbon blades . . . GOHARD dust hubs and rings . . . manifold water distribution . . . heavy-duty self-aligning bearings . . . "Mix-Timer" equipped—assures minimum mix time . . . air operated discharge door . . . custom-built extras to satisfy individual requirements. Other GOCORP Mixer sizes—12, 18, 28, 42 and 50 cu. ft. capacity.

*GOHARD is a special nickel chrome alloy casting manufactured to GOCORP specifications.

For modern, proven concrete products equipment write or phone

GO CORP
ADRIAN-MICH.
403 GRACE ST., ADRIAN, MICH.

WAREHOUSING Gibraltar Style

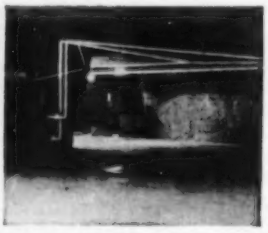


● Hewn out of limestone rock, with 72-ft.-thick roof, 40-ft. spans between solid-rock columns, and entry through a vertical ledge of stone, NATURAL STORAGE COMPANY's warehouse at Coldspur, Kansas, on the Union Pacific, 17 miles west of Kansas City, is a Gibraltar-like answer to modern-age storage problems.

This previously-mined area of a limestone deposit provides ideal storage conditions, safely above flood, floors at ground level, no limit on floor loads, with 150,000 sq. ft. and 2½-million cu. ft. of storage space, and plans for expansion to ten-million cubic feet.

Suggesting the utilization of many other subterranean mined areas for safe storage of all kinds, this cave-type warehouse has year-around 55° F. temperature, serving as natural insulation for added refrigeration to chill or freeze meats, vegetables and fruits, in separate rooms.

Finishing quality touch are heavy-duty floors of Lone Star Cement concrete, 5,000 cu. yds. to date, placed on the rock base—man-made stone with the strength and durability for which Lone Star Cements are noted, on the basis of outstanding nation-wide performance.



NATURAL STORAGE COMPANY, INC. WAREHOUSE
Coldspur, Kansas

Floor Construction:
JOHN ROHRER CONTRACTING COMPANY

Ready-Mix Lone Star Concrete:
CONCRETE MATERIALS, INC.

both of Kansas City, Kansas

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. • BIRMINGHAM
BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS
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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 129,000,000 SACKS ANNUAL CAPACITY

The CONCRETE MANUFACTURER

May 1953

About Good Will . . .

AT THE considerable risk of seeming to labor a theme which has already been beaten to a pulp by others, we would like to unload a few random thoughts on the subject of public relations. We have a fine opportunity to study one important aspect of public relations every time we cool our heels in the outer offices of the plants we visit in our never-ending search for editorial material. For periods ranging from a few minutes to an hour or more we get a revealing closeup of how customers are handled both at the counter and over the telephone. Sometimes, of course, the impression created is good, but more often than not we're amazed at the average customer's apparent capacity for absorbing entirely unnecessary punishment.

Our hunch is that about nine businesses out of ten in the field we know best make little or no consistent use of simple courtesy in day-to-day dealings with customers. Perhaps it's because courtesy appears to be free that we neglect it so persistently, but regardless of the reason, the fact remains that there isn't any substitute for it. Nor, in a strict sense, can it be regarded as a free device, for it can only be acquired and maintained by means of a great deal of intelligent concentration.

The kind of courtesy we are talking about can best be studied in the sales office, within earshot of the telephone switchboard, and the order clerk, and the salesmen and others who deal with the public. The telephone itself subjects courtesy to an acid test. Properly used, it can be a wonderful business tool; improperly used, it can chase customers away by the boatload. We would suggest to plant owners and managers that they give the problem of telephone courtesy the very serious attention it justifies. Find out at first hand the kind of treatment your customer receives when he phones your offices. Does warmth, courtesy, and consideration await him, or is he likely to be greeted by a bored or snarling voice, or a short temper, or an unmistakable implication that his call has interrupted matters of infinitely greater importance?

If your company's telephone performance is indifferent, or downright poor, it's a lead pipe cinch that you're creating business for a competitor. While there's always a chance that the competitor may be guilty of the same shortsightedness, it's also possible that he may be one of those unusual Joes who doesn't miss any bets; and in that case you may be helping him to put your business squarely on the rocks.

All sales office personnel should probably be re-evaluated from time to time in terms of how they affect the one asset—good will—without which your business cannot possibly survive. Just by periodically focusing attention on the problem, some improvement usually results, for most people know far more about how to deal with human beings than their actual performance indicates; what each of us needs in varying degree is an occasional reminder of the vinegar-versus-molasses bromide.

Despite all that has been said and written on the subject, salesmen still persist in winning arguments at the expense of losing orders, and every business at some time or other finds itself saddled with some frustrated character who appoints himself vice-president in charge of telling customers where to get off. It happens to big outfits and little ones, and the only dependable safeguard is constant alertness and a cultivated talent for self criticism. We urge our readers to appraise and evaluate the performance of their own organizations in respect to building good will. Take a good long look, and then go to work to bring about some of the improvement for which there is always unlimited room.

William M. Avery

Another Leader IN THE PRODUCTS INDUSTRY PREFERS BESSER VIBRAPACS!

★ This is the 100th of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac, the *Original Plain Pallet Stripper.*

Norman Griffin, Plant Manager for the Riefler Concrete Products plant at Hamburg, N. Y. and Paul C. Riefler, President-Owner who takes an active part in the business.

"We Feel that Besser is the Finest Block Making Equipment Available"

This statement, by Paul C. Riefler, is particularly significant because it is based on actual experience. The Riefler plant, located in Hamburg, N. Y., has been manufacturing concrete block, all types and sizes, since 1942. The production of Soffit Block, for floors and roofs, is a more recent activity.

When new equipment was required, the company selected an Automatic Vibrapac with Front Pallet Feed due to its excellent reputation for producing high-quality block ever since the advent of vibration. Mr. Riefler states further: "We are very well pleased with all our relations with the Besser Company, especially the lease contract."

Besser Vibrapacs are preferred by products plants everywhere because they are fully automatic and continue to operate, day after day, week after week, with no "downtime." Get the facts. Write today for literature.

Exterior view of the Riefler plant showing stock pile of block in cubes for economy in handling. Note lift truck used for expediting delivery. Cubing of block permits higher stacking and easier loading.

Besser Front Pallet Feed Vibrapac installed at the Riefler plant. Fully automatic. One man removes finished block with power off-bearing hoist, and, with no lost motion, returns empty pallets to Vibrapac. Produces three 8 x 8 x 16 modular units at a time on one Plain Pallet. Other sizes made in same multiple on one set of Plain Pallets.

BESSER MANUFACTURING CO.

Complete Equipment for Concrete Products Plants

ALPENA, MICHIGAN, U.S.A.

BESSER

BATCH MIXERS | SKIP LOADERS | BLOCK & BRICK CUBERS | SUPER VIBRAPAC | SINTERING PLANTS | ACROW CENTERS | ROOF TILE MACHINE

news of the concrete industries

Concrete Products Assn. Of Washington Convenes For 24th Spring Meeting

The 24th annual spring meeting of the Concrete Products Association of Washington was held on Friday and Saturday, March 20 and 21 in the Construction Center Building, Seattle, Wash. A well-organized program of talks, reports and discussion included a session on concrete masonry, with a business meeting the following morning and a joint session on concrete pipe and precast prestressed concrete at the closing session.

The significance of earthquake design to the industry was discussed by W. Beardsley, with particular reference to a recent attempt to introduce a bill on seismic design requirements to the Washington State Legislature. Discussion of this subject by the group was representative of the interest of the construction industry in the earthquake load-carrying capacities of buildings and building materials. Important action on the subject was taken in the form of a motion to request that the Industrial Research Division of Washington State College proceed on a survey of available information and a study aimed at the development of theoretical design. This motion was passed.

The concrete pipe session began with discussion on attempts to standardize the dimensions of sewer pipe bells manufactured by association members. Following this discussion C. M. Howard, engineer-manager of the association, reported the previous action of Committee C-13 on A.S.T.M. Fill Test Standards in that the permeability (fill) test would replace the hydrostatic test with an accompanying probable change in the time length of the test. It was requested by a motion that the association Pipe Standards Committee study the new tentative specifications.

The location of expansion joints and air vents in concrete irrigation pipe lines were two research projects on which John Roberson of the Industrial Research Division of Washington State College reported. The results of these projects indicated the need for further studies, particularly with regard to the location of air vents in pipe lines. Mr. Roberson assured the members that a practical method of determining the location of these vents would be his next step in the project.

Keith Douglass, plant engineer for the B. C. Concrete Company, Limited, Vancouver, B. C., presented and discussed a paper on *Experiences in the Design and Construction of Prestressed Concrete*. The speaker had taken part in the design, testing, and furnishing of several precast, post-tensioned, concrete girders for bridge and building roof construction in British Columbia, and he pointed out the economic and strength values of such members.

New N.C.M.A. Branch Office Opened in Washington, D.C.

The Washington, D. C., office of the National Concrete Masonry Association is now established at the Evans Building, 1420 New York Avenue, N.W., with Theodore Leba Jr. in charge as manager.

Members of N.C.M.A. writing to the general office at 38 South Dearborn Avenue, Chicago 3, Ill., on matters requiring the attention of the Washington staff are requested to attach carbon copies of their letters, which can then be transmitted to Washington.

In general, the functions of the Washington headquarters will be to develop and maintain contacts with governmental agencies concerned with the problems of the concrete masonry industry.

At Downey, Calif., the United Block Corporation is one of the newest industries. The firm uses the mixing storage facilities of Adobe Engineers, block producers located at the same site. Products will be 6- by 8- by 16-in. slag cinder blocks exclusively, using a Lith-I-Block machine.

Coming Events

June 29-July 3, 1953 — Atlantic City. 51st annual meeting, American Society for Testing Materials. Chalfonte-Haddon Hall.

September 28-30, 1953—Colorado Springs. Directors' meeting, National Ready Mixed Concrete Association and National Sand and Gravel Association. The Broadmoor.

Two Firms Collaborate On $1,000,000 Contract For Prestressed Pipe

Under the terms of a $1,000,000 contract recently won by the Idaho Concrete Pipe Company of Nampa, Idaho, and the Tellyer Concrete Pipe Company of Albuquerque, N. M., these firms will supply more than 14-miles of pipe to connect Albuquerque with a reservoir.

Pipe sections will be fabricated on machinery furnished by Idaho Concrete, and the process used will be one perfected at the plant of the Nampa concern. Known by the trade name "Cen-Vi-Ro", the pipe undergoes centrifugal spinning and is strengthened by wrapping with 8-gauge wire. Finally it is smoothed by a roller which exerts 8 tons of pressure inside the pipe to make an impervious wall. Cen-Vi-Ro sections are subjected to a plant test of 360 p.s.i. water pressure.

All of the pipe furnished on the Albuquerque line will be manufactured on a Cen-Vi-Ro machine designed, built, and patented by George Jessen and Carl Chanlund of the Cen-Vi-Ro Manufacturing Company. The device for prestressing (wire-wrapping) the pipe was designed by members of the engineering department under Stephan R. Hubbard, chief engineer. Both machines were constructed in the Idaho Concrete Pipe Company's plant and shipped by truck to Albuquerque. A testing machine was also built at Nampa.

George Jessen is the president of the Idaho Concrete Pipe Company; and Harry Tellyer heads the Albuquerque firm.

California Concern Opens R.M.C. Plant at Garden Grove

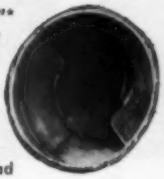
Garden Grove, Calif., is the location of the sixth plant of the Foster Sand & Gravel Company, which recently opened new facilities for producing ready-mixed concrete in that city. Completed late last year, the plant represents an investment of $35,000 and equipment worth $45,000.

The firm was founded in 1920 by Albert L. Foster and was acquired in 1948 by G. L. Werner, E. W. Foster, and K. C. Foster. At the time these three took over the business, it consisted of a sand plant in Orange, a ready-mix plant in Anaheim, and a concrete products division and general offices in Fullerton.

these *outstanding* CHALLENGE FEATURES "work together" to set

A NEW STANDARD IN TRUCK MIXER EFFICIENCY

1 **FIRST, THERE'S THE CHALLENGE PATENTED "DAM"*** . . . a unique system of baffle plates integrally welded to the rear cone section. The Challenge "DAM" makes the drum seal obsolete . . . prevents spillage even on steep grades. But the "DAM" does more! It cooperates actively in the thorough, uniform mixing action for which Challenge is famous . . . and helps in fast, efficient discharge as well. No payload-eating dead weight here . . . or useless contraptions that add to maintenance costs.



*U. S. Patent #2,618,472

2 **SECOND, THERE'S THE CHALLENGE CONTINUOUS TYPE "THORO-MIX" BLADES** . . . working with the reverse fins in the head section of the drum providing continuous agitation, continuous blending of aggregate, cement and water to form concrete that's uniformly and thoroughly mixed. Here is a Truck Mixer that *mixes* at top efficiency!

3 **THIRD, THERE'S THE LOW 14° DRUM ANGLE** . . . adopted by Challenge engineers after extensive research demonstrated maximum mixing and discharge efficiency from this angle. The low 14° angle of the drum assures faster discharge of the lowest slump concrete, yet maintains highest discharge height above the truck chassis while holding overall loading height to minimum.

. . . you can get some idea of the unique features incorporated in Challenge just by studying these pictures . . . but you've really got to see a Challenge in action to know how they add up to more [illegible] for you. Your Challenge dealer will be glad [illegible] demonstrate, at no cost.

Member N.R.M.C.A.

Cook Bros. Equipment Co.
Please send name and address of nearest Challenge dealer.

NAME _____

ADDRESS _____

CITY _____ STATE _____

COOK BROS. EQUIPMENT COMPANY
1815 No. Broadway CApitol 2-9111
Los Angeles 31, California

Seated: Frank D. Snyder, Marengo; B. A. Wettig, Dayton; C. L. Wiles, Columbus; George B. Eichenlaub, Columbus; Samson I. Crew, Cincinnati; Harrie P. Clegg Jr., Dayton; O. H. Seeger, Columbus; W. C. Lewis, Dayton; Sam C. Davis, Dayton; and Louis Stuber, Mogadore; Standing: H. J. Schmitz, Mansfield; James E. Callihan, Chillicothe; Vic Scott, Dayton; J. E. Crissman, Columbus; R. E. Francis, Cincinnati; Dan G. Newton, Hamilton; V. J. McDevitt, Mogadore; E. E. Osborn, Wilmington; J. Paul Batterson, Columbus; Peter J. Minck, Columbus; Frederick R. Lang, Columbus; William H. Ebling, Lima; William A. Rodgers, Chillicothe; Robert W. Geist, Piqua; John F. Royer, Columbus; and Harold G. Edwards, Columbus.

R. E. Francis President Of New Ohio Association Of Block Manufacturers

A group of 25 Ohio block manufacturers organized the Ohio Concrete Block Association, Inc., on March 19 at Columbus, choosing R. E. Francis, president of Reading Concrete Products, Inc., Cincinnati, as president.

Other officers elected were as follows: Harrie P. Clegg Jr. (president, The Crume Brick Co., Dayton), first vice-president; William A. Rodgers (division manager, Basic Construction Materials, Chillicothe), second vice-president; and Samson I. Crew (vice-president and treasurer, Crew Builders Supply Co., Cincinnati), treasurer; John F. Royer (secretary of the Columbus Concrete Block Association), secretary.

In addition to the officers, trustees elected include O. H. Seeger (Harry Wellnitz Co., Columbus), who is the immediate past-president of the Columbus Association; Frank D. Snyder (Snyder's Milling Service, Marengo); Robert W. Geist (Geist Block & Supply Co., Piqua); E. E. Osborn (The Clinton Construction Co., Wilmington); William H. Ebling (Lima Cement Products, Inc., Lima); V. J. McDevitt (The Akron Brick & Block Co., Mogadore); Dan G. Newton (Concrete Masonry Units, Hamilton); and H. J. Schmitz (Cement Products, Inc., Mansfield). The temporary chairman of the organization meeting was Mr. Seeger.

The Columbus Association started the ball rolling last December, and an organization committee made up of Sam C. Davis (Price Brothers Company, Dayton); Messrs. Seeger, Geist, Schmitz, Osborn, Crew, and Francis met in January to formulate plans. The new organization is located at 50 E. Broad St., Columbus.

Expenditures for new construction increased by 10 percent during March to $2,500,000,000, rounding out a record first-quarter total of $7,000,000,000, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Division of the U. S. Department of Commerce. The January-March total also represents a first-quarter record for work actually done on new construction, after allowance for higher costs.

5th Annual Sakrete Meeting Draws Nation-Wide Attendance

The fifth annual meeting of Sakrete Industries was held February from 19 to 20, 1953, at the Biltmore Hotel, Los Angeles, the week before the combined N.S.G.A.-N.R.M.C.A. conventions in San Francisco. It was attended by Sakrete licensees from all parts of the country, who were rewarded by a very interesting and informative meeting.

At one session, under the chairmanship of John C. Stewart, Texas Dry Concrete Co., Fort Worth, Texas, a report on the investigation of the possibilities of new railroad rates on Sakrete products was presented by Harold DeMar of Sakrete Inc. In the discussion following the report it was learned that most of the producers were now shipping in their own trucking equipment or using contract carriers, which made consideration of reduced freight rates by the railroads relatively unimportant. It was decided to hold any further action in abeyance until action is taken on a few specific cases now before the freight committees.

A progress report on the new resilient concrete was then presented by A. C. Avril, president of Sakrete Inc., licensor, who demonstrated at the meeting that the research program contracted for with the University of Cincinnati has resulted in the development of a completely dry mixed product, which gives a resilient concrete when mixed with water and placed as ordinary concrete. It was demonstrated that the adhesion to other materials was beyond expectations. It was also reported that some of the vital ingredients in this new product were produced by suppliers on an experimental basis, and that it would be several months at least before the product would be available for the commercial market.

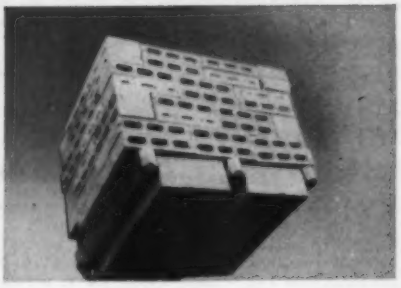
Mr. Avril also made a demonstration of the application of the new cement paint developed by the research program. He showed the group that it could be applied to concrete or masonry, and set up within a two hour period to a point where it was impossible to rub any of it off. This can be accomplished without wet curing. This paint has been in actual field service for a period of eighteen months with no signs of deterioration or weathering. The delay in getting it on the market is due to the lack of production of one of the vital ingredients on a commercial basis.

In another session, under the chairmanship of W. E. Mussett, Dry Mix Concrete Co., Franklin Park, Ill., related costs of operation and delivery, maintenance suggestions, new methods, and equipment in Sakrete operations were considered. It was a round table discussion, and everybody presented ideas from experiences in operations. Some very valuable maintenance and operating suggestions resulted from this discussion. The group was informed by Mr. Avril that a new piece of equipment to handle bags mechanically, eliminating at least 50 percent of the labor, was in the blue print stage.

With J. D. Stewart, Mill Creek Transit Mix Inc. of Salt Lake City, presiding, an open discussion was held on the coordinated advertising program, including national advertising of all types and all local and point-of-sale advertising. The program was presented to the group by the executive committee composed of the following: Albert Cummins, Harry T. Campbell Sons' Corp.; W. E. Mussett, Dry Mix Concrete Co.; John C. Stewart, Texas Dry Concrete Co.; and Mr. Avril. The program presented by this committee was approved by the group, and everyone agreed to use all of the advertising material presented, and to share the cost on a subscription basis of the various magazines in which advertising has been placed. The biggest portion of the national program was allocated to *Better Homes & Gardens* and *Popular Mechanics*.

BICKERSTAFF

BLOCK FORKS



Handles block on 16" dimension. *

• • •

4848 model gives perfect unit for cubers.

• • •

The only block fork for self unloading truck bodies.

• • •

Simple to operate, weight of load actuates grippers.

• • •

Hydraulic actuated grippers for light loads.

• • •

No installation problems. Equipped to your truck in a matter of seconds.

• • •

Truck and trailers loaded in 10 minutes.

*Special forks for 18" blocks.

BICKERSTAFF INCORPORATED

MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT

Columbus, Georgia

WEST COAST REP. WALTER C. STOLL & SONS 5028 ALHAMBRA AVENUE. LOS ANGELES 32, CALIF.

C. M. Howard to Retire From Washington Assn.—W. S. Callender Appointed

Completing 24 years of service as engineer-manager with the Concrete Products Association of Washington at Seattle, C. M. Howard will retire from active management on May 31 of this year. He will serve as a consultant to the association and will be available to other clients in a similar capacity, according to

C. M. Howard

W. S. Callender

an announcement by R. W. Condon, president of the association.

Joining the newly-organized Concrete Pipe Manufacturers of Western Washington in 1929, Mr. Howard has seen the growth of the association from a small nucleus of 12 concrete pipe manufacturers to the Concrete Pipe and Products Association (1940) and then to the Concrete Products Association of Washington (1947), with a membership of 28 Washington manufacturers of concrete products.

He is recognized nationally as an authority on concrete pipe and is serving on A.S.T.M. Committee C-13, reviewing specifications for concrete. He is also a member of the American Concrete Pipe Association. He has served as president of the Seattle section of the American Society of Civil Engineers and is affiliated with several other professional groups.

Succeeding Mr. Howard will be W. Stephen Callender, who comes to the Concrete Products Association of Washington from the W. H. Witt Company, Seattle, where he has been employed for the last three years in structural design work. He started with the association on April 1 and will take over active management on June 1.

Prize-Winning Home Designs Offered to N.C.M.A. Members

One of the feature attractions at the National Concrete Masonry Association convention in Cleveland was the outstanding display of entries in the recent architectural competition co-sponsored by the Michigan Society of Architects and the Concrete Products Association of Michigan. This competition, which offered over $3,000 in prizes, called for the design of a one-story, full basement, three-bedroom concrete masonry home not to exceed 1,100 sq. ft. in area, and designed specifically for an average family.

Contestants submitted 26 designs, 13 of which won prizes. These are available in quantities to members of the National Concrete Masonry Association. Orders should be sent, with your check or money order, to the Concrete Products Association of Michigan, 1402 Kales Building, 76 Adams Avenue, West, Detroit 26, Mich.

Delzer Construction Co. Announces 300 T.P.H. Plant

At Mandan, N.D., the new ready-mixed concrete plant of the Delzer Construction Company was completed recently. It is twice the capacity of the firm's plant in Bismarck and will be one of the most modern in the state, according to Ray Delzer, plant manager.

Production is expected to be at the rate of 300 t.p.h. Equipment includes eight 5½-cu. yd. mixer trucks and a 200-ft. belt conveyor. Mandan facilities allow for stockpiling of 3,000 cu. yd. of aggregates.

At Sioux Falls, S.D., the Acme Concrete Company was recently dissolved by mutual consent of the owners, who then formed two companies—Stadum Brothers and the Norlin Concrete Company.

Nebraska Products Firm Finds Insurance an Economy Measure

To point up the idea that liability insurance pays off in the concrete masonry industry, as well as in related fields, we offer the following evidence. We reproduce, with permission, a letter received recently by Earl W. Peterson, vice-president and secretary of the Ideal Cement Stone Company, Inc., Omaha, Nebr., from the H. A. Wolf Company, an insurance firm.

Dear Mr. Peterson:

In the face of a trend of public liability and workmen's compensation insurance where rising losses have caused increased rates, I am particularly happy to report to you the history of your workmen's compensation coverage, which has for a number of years experienced a very fine loss ratio. With the assistance of the Home Office Underwriting and Loss Departments, and my own files, I have compiled data illustrating the savings to your company directly resulting from your excellent workmen's compensation experience. I submit the following figures:

	Experience Credit	Manual Prem.	Standard Prem.	Retrospective Prem.	Losses	Return Prem.
1948-1949	7 %	$5064	$5268	$4847	$1386	$421
1949-1950	23.6%	5630	4302	4000	1893	302
1950-1951	30.7%	6050	4193	3841	297	342
1951-1952	41.4%	6067	3567	Undetermined		
1952-1953	40.9%					

To clarify the above picture, I enclose the following definitions:

Manual Premium—the cost of your insurance prior to the application of the experience credit.

Standard Premium—the cost of your insurance computed with the experience credit but prior to retrospective computation.

Retrospective premium—final premium after experience credit and retrospective plan computation.

The retrospective plan of insurance contemplates that each risk will bear its own losses up to a set maximum and will, therefore, reap the benefit of good loss experience and suffer from poor loss experience. The retrospective plan used on the above figures is "Plan A," in which the maximum premium that can be assessed by the insurance company is the standard premium, while the minimum premium is 91.6% of the standard; however, other plans in which the assured takes a greater chance of gaining greater sums for good experience and losing greater sums for poor experience carry maximum costs of 178% of standard premium and minimum premiums of approximately 40% of standard premium.

I have chosen the year of 1950-1951 to cite an example of maximum and minimum premiums involved in "Plan C", where the assured's gamble is greatest. The actual return premium of this year's experience could have been approximately $2,051, leaving a net cost of $2,142. This extremely low figure is due to the unusual loss figure of $397. I also think it wise to point out that in the case of extremely poor loss experience, the maximum premium under this plan would have been approximately $7,500.

Your present workmen's compensation coverage is written on "Plan C" Retrospective. The above example illustrates the great savings possible to your organization from good experience and also the heavily increased cost that may result from adverse experience. I offer my wholehearted support and assistance to you in the continuance of your accident prevention program, which is such a very important part of your plant operation.

I cannot help but feel that the above information, which I understand is to be included in your convention report to the convention of concrete block manufacturers, will point out to other concrete block concerns across the country the possible savings available in workmen's compensation coverage on good experience. It will not only assist them in reducing their overhead but will help reduce the number of industrial accidents which each year cause so great a loss to our country.

If I can be of further assistance with any information, please feel free to call on me.

Yours very truly,
BARTON H. GREENBERG, CPCU
Asst. Manager, Ins. Dept.

According to Mr. Peterson, if workmen's compensation were written at the annual rate, the following rates prevail in the states named: New York, $8.22; Nebraska, $4.41; Florida, $3.75; Texas, $3.63; and Minnesota, $3.28.

HERE ARE HELTZEL'S NEW *COMPLETELY AUTOMATIC ELECTRONICALLY CONTROLLED* BATCHING PLANTS...

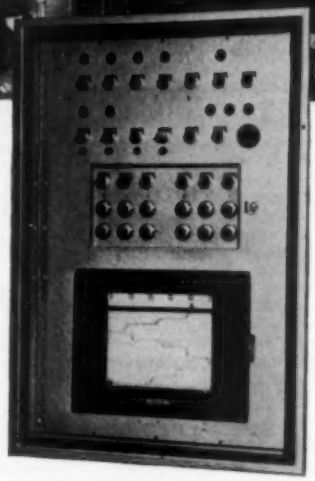
Two new Heltzel Batching Plants at work on the Ohio Turnpike. Built to conform with Ohio Turnpike Commission specifications, the Cement Plant (left) has a 400 bbl. capacity with a 375 bbl. recirculator. Three-compartment aggregate Plant (right) holds up to 200 tons.

Here's real news for contractors who want batching equipment that will do more with less labor. The new electronically actuated fully automatic Heltzel plants designed for road builders, truck mixer and central mix operations.

Push button operated by one man these job-tested plants will batch up to 250 yards of perfectly proportioned batches per hour . . . with 29 separate batch combinations immediately available to the operator. Each batch, time and amount electrically recorded for easy daily tabulation.

Portable, the plants were designed for quick set-up and knock-down, easy over-the-road handling. For permanent installation Heltzel's combination cement-aggregate plant would be used instead of two separate plants.

For additional information write or call **The Heltzel Steel Form and Iron Co., Warren, Ohio,** and ask for Bulletin O-21.



Push button panel with recording equipment. Each of the 29 batch selection buttons controls a completely different mix. Panel will be wired to suit your individual requirements. Recording equipment optional.

— Naturally It's A Heltzel *Flex-Plane* *Product —*

Hummel Heads Midwest R.M.C. Assn. At Eleventh Annual Meeting

The Midwest Ready Mixed Concrete Association, formerly the Wabash Valley Ready Mixed Concrete Association, held its 11th annual meeting on March 30-31 at the Drake Hotel in Chicago. The meeting was the largest in the organization's history, with attendance reaching a total of 212.

Officers for 1953 elected at the general business meeting were as follows: Robert J. Hummel, Consumers Company, Chicago, president; D. C. Hay, Kuert Concrete, Inc., South Bend, Ind., vice-president; L. L. Shidler, Triangle Construction Company, Kankakee, Ill., treasurer; and R. E. Hutchins, Terre Haute, Ind., secretary (re-elected). The retiring president, Ernest Horne, Ready Mixed Concrete Corporation, Indianapolis, Ind., was presented a scroll lauding his services. It was pointed out that Mr. Horne had served in all of the offices since the Midwestern group was formed 11 years ago.

Appointed to the board of directors for three-year terms were R. E. Weaver, Lincoln Sand and Gravel Company, Lincoln, Ill.; E. M. Stephens, Stephens Ready-Mixed Concrete Company, Cairo, Ill., and R. J. Jennings, Builders Concrete Inc., Muncie, Ind.

The meeting featured a well-rounded program of speeches, reports, panel discussions, and entertainment. Two officials of the National Ready Mixed Concrete Association, Washington, D. C., Stanton Walker, director of engineering, and Vincent P. Ahearn, executive-secretary, discussed recent developments in the ready-mix industry. Mr. Walker reported on recent truck mixer tests conducted by the national association at the University of Maryland in conjunction with the Truck Mixer Manufacturers Bureau, while Mr. Ahearn spoke on recent developments in Washington.

William B. Ryan, manager, ready-mixed concrete department, Consumers Company, Chicago, reported on *Some Idiosyncracies of Concrete*. In addition, a highly successful informal panel discussion was held, in which C. S. Ward, R. J. Jennings, L. L. Shidler, D. C. Hay, and E. C. Scott, as well as several members of the audience, participated.

The first "Dolly" Gray Essay Award was presented by Ernest Horne to Robert M. Koscielny, junior in civil engineering, University of Illinois, for his essay *Fly Ash in Concrete*. Mr. Koscielny also presented his essay at the meeting.

The Midwest Ready Mixed Concrete Association now has a membership of 113, including 61 firms from Illinois, 45 from Indiana, 3 from Kentucky, and 4 from Wisconsin.

Clarence B. Monk, one of the research men who developed the king-size "SCR brick", addressed the American Ceramics Society on January 30, at the Chicago Engineers club.

● Officers and directors of the Midwest Ready Mixed Concrete Association. Seated, left to right: Miss Harriet Bell, Zimmerly Construction Co., Paris, Ill.; L. L. Shidler, Triangle Construction Co., Kankakee, Ill. (treasurer); R. J. Hummel, Consumers Co., Chicago, Ill. (president); and D. C. Hay, Kuert Concrete, Inc., South Bend, Ind (vice-president). Standing, left to right: R. J. Jennings, Builders Concrete Inc., Muncie, Ind.; R. E. Hutchins, Terre Haute, Ind. (secretary); C. S. Ward, Nelson Concrete Culvert Co., Mt. Vernon, Ill.; A. F. Bieker, Bieker Co., Hammond, Ind.; E. M. Stephens, Stephens Ready Mixed Concrete Co., Cairo, Ill.; D. L. Moritz, C-J Ready Mixed Concrete Co., Effingham, Ill.; and Ernest Horne, Ready Mixed Concrete Corporation, Indianapolis, Ind. (retiring president). Directors not shown here are R. E. Weaver and W. L. Covalt.

C. G. Smithwick Succeeds Otto C. Frei as Manager Of Production at Smithwick

Carleton G. Smithwick, secretary-treasurer of the Smithwick Concrete Products, Portland, Oreg., has been appointed production manager of all Portland and Vernonia operations of the

C. G. Smithwick

Otto C. Frei

firm, it was announced by S. Carl Smithwick, president. This will include the haydite expanded-shale plant and block plant at Portland and the quarry operations near Vernonia, Oreg. His principal assistant will be John Gray, haydite plant superintendent.

Mr. Smithwick succeeds Otto C. Frei, who has resigned to become president of the Georgia Lightweight Aggregate Company, effective April 1. The Georgia company expects to have its modern two-kiln expanded-shale plant completed and in operation by June of this year.

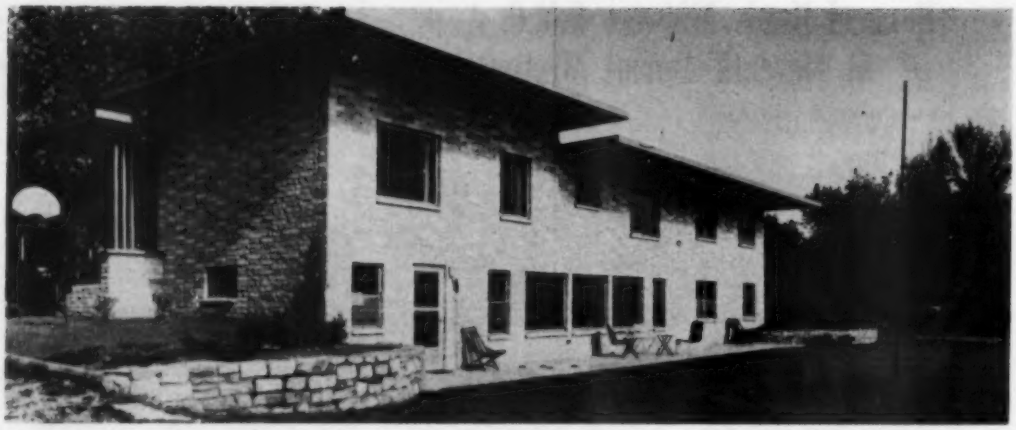
The new production manager of Smithwick Concrete Products has come up through the ranks of the company. He was successively lift truck operator at the Portland block plant, then salesman, later production manager at the Eugene division, and finally superintendent of the haydite processing plant in Portland. He recently received his law degree from Montana State University.

Brouk Co. Is Sales Agency For Great Lakes Carbon Div.

Great Lakes Carbon Corporation, Perlite Division, has appointed J. J. Brouk and Company, St. Louis, as its national sales agency, it was announced recently. J. John Brouk, president of J. J. Brouk and Company, also is president of Precast Slab and Tile Company in St. Louis.

Announcement of the appointment of a national sales agency follows previous announcements by Great Lakes Carbon Corporation, Perlite Division, of the acquisition of the Alexite perlite mine and plant in Colorado, and the execution of an exclusive Permalite franchise agreement with Precast Slab and Tile Company for the use of Permalite Alexite ore.

Stockholders of Ephrata Pre-Mix, Ephrata, Wash., recently announced the purchase of the controlling interest of Quincy Brick & Mix. The resultant new organization, which will operate plants in Ephrata, Warden, and Quincy, Wash., will be known as Empire Concrete Products Company, Inc. Ray Molitor will serve as manager of the Quincy branch.



General view of the all-concrete masonry residence of Mr. and Mrs. P. M. Park of Alpena, Mich. Situated on property adjoining Thunder Bay, the home was designed so that all rooms face the water.

All-Concrete-Masonry Home Demonstrates Tremendous Versatility of Product

ONE of the outstanding recent demonstrations we have seen of the tremendous versatility and economy of concrete masonry for residential purposes is the home of Mr. and Mrs. P. M. Park of Alpena, Mich. As the accompanying photographs attest, the owner, the architect, and the builder combined their talents and their knowledge of the product in such ways as to achieve its maximum use throughout the structure, while at the same time successfully avoiding the monotone effect that sometimes results from the too-persistent adaptation of any single material to the myriad needs of a modern home.

Since both exterior and interior walls, as well as a number of the ceilings, consist primarily of exposed masonry units, the project provided a prime opportunity to test the vaunted versatility of the product, and the results appear to be all that the most ardent block enthusiast could wish. The 13-in. exterior walls consist of nominal 4- by 4- by 16-in. split block, laid in both standard and stacked bond, and separated by 1½ in. of air space from the 8-in.-thick Waylite backup units. Numerous patterns and heights and a wide range of joint treatments were employed to achieve striking effects with the interior surfaces of outside walls, as well as with both 4- and 8-in. partitions.

In seeking maximum durability, comfort, fire safety and economy the designer has taken full advantage of the potential of concrete masonry for eliminating costly, time-consuming interior trim. The effects this achieved are entirely pleasing to the eye, and the resulting savings in no small measure account for the excellent economy of the finished structure. Trim was eliminated at window and door openings by the extensive use of bullnose masonry units, and horizontal surfaces meet vertical surfaces without recourse to baseboards, cove moldings, and other distracting as well as costly millwork items. Floors and roof are of soffit block construction, and ceilings were left exposed except in the kitchen, and living and dining rooms. The oil-fired radiant heating system utilizes two circulating pumps upstairs and one downstairs.

According to our understanding, no wood was used anywhere in the construction of the house. The double-hung windows are of aluminum and all main doors and frames, as well as sliding closet doors, are of Truscon steel. Walls throughout the house were left unplastered, but were painted with Super-Kemtone.

Although the home is located in the center of Alpena, the property adjoins Lake Huron's Thunder Bay, and the surpassingly beautiful view

The den, like all other rooms in the house, provides a fine view of the bay. Note the unplastered soffit-block ceiling.

has been utilized to the utmost by having all the rooms face the lake. The two-story structure has eleven effective rooms with a total floor area of 4,220 sq. ft., and there are two full baths and two half baths. It was built at a total cost of $46,400, or about $11 per sq. ft.

Because of their interest in the

(*Continued on page* 250.)

Right: Exposed concrete masonry walls and ceilings are painted throughout most of the house. A pleasing effect was obtained on one wall of this bedroom by using alternate courses of half- and full-height units.

Left Below: View of the 20- by 32-ft. activity room on the first floor. Considered the main room of the "cottage", it has 24 ft. of windows facing the bay.

Below: Closeup of the entrance, showing the effective use of split units in both stack bond and broken bond.

Above: General view of the living and dining room areas, showing a few of the many wall patterns used. Ceiling of these rooms have acoustical plaster.

Below: Entrance hall detail, showing how both standard and half-high units were used to avoid monotony. Note also the omission of trim around the doorway and at the floor and ceiling lines.

Many Advantages in Two-Plant Setup For Ready-Mixed-Concrete Operations

Fort Wayne concern builds auxiliary unit to ease load on main plant, cut traffic delays, and improve service generally.

By WILLIAM M. AVERY

General view of the new central mixing plant of Erie Ready Mixed Concrete, Inc., Fort Wayne, Ind. Plant bins are fed from open stockpiles by means of clamshell, hopper and bucket elevator.

another ON THE SPOT report

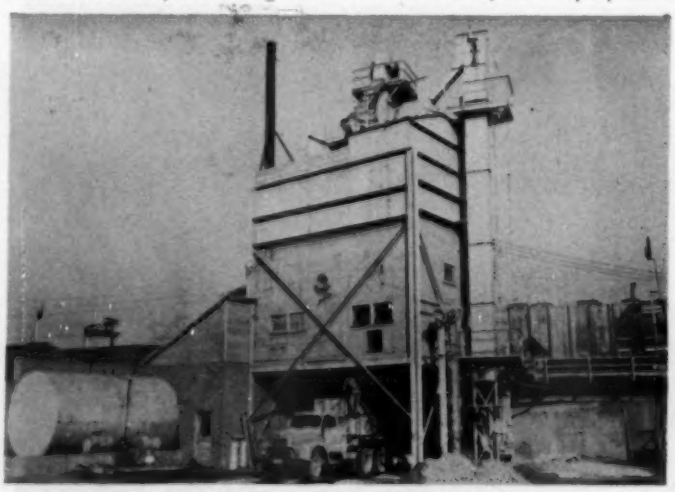
ONE of the most interesting new plant installations we have seen in the ready-mix industry in some time was completed and placed in operation last summer by Erie Ready Mixed Concrete, Inc., of Fort Wayne, Indiana. As is so often the case, the reasons which led to the construction of this particular plant in its precise location are probably far more revealing and significant than any mere description of the facilities involved.

The firm is not by any means a newcomer in the ready-mixed-concrete business. Its first plant was installed in Fort Wayne almost two decades ago, and the company's growth has closely paralleled the tremendous industrial development of Indiana's third-largest city (the 1950 census showed 133,607).

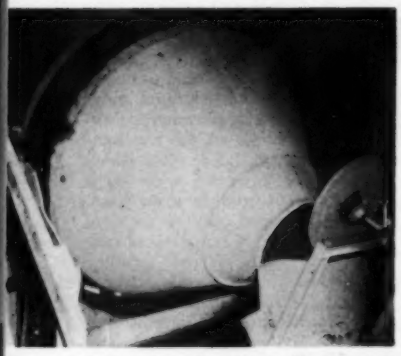
As so often happens, the community's growing pains have considerably complicated the job of delivering ready-mixed concrete, and for several years Erie has recognized that in the interests of efficiency and good service a second batching plant was a matter of prime necessity. The existing plant, built about a dozen years ago, was located about a mile south of Fort Wayne's bustling business section, which meant that trucks bound for the *north* side of town had to inch their way through dense downtown traffic. Thus normal traffic delays, coupled with the completely unpredictable tie-ups produced by a major railroad which crosses the city at grade level east and west, often resulted in unsatisfactory service to customers as well as inefficient utilization of delivery equipment.

Simple logic, therefore, indicated that an auxiliary to the main plant would be most effective if located north of the business section, and there was also a fair amount of solid evidence which led to the same conclusion. In recent years the area of rapid growth had been north of the city proper, and all signs indicated that this drift would accelerate in years to come. Two recent annexation ordinances have been passed covering 2,000 acres of land at the north edge of the city, and a diversion highway just completed clears the north city limits by just a mile.

With the question of location narrowed down to a relatively simple matter of finding a suitable site within a fixed area, the company made



Still used as a year-around plant is this dry-batching set-up located about a mile south of Fort Wayne's business section.



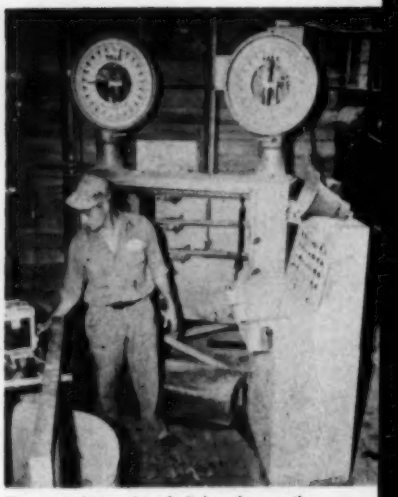
View of the tilting mixer in the new plant. This unit is rated at 3 cu. yd. capacity.

short work of the problem of what kind and size of plant to build. The main plant is an all-weather dry-batching setup with a (10-hr.) daily capacity of approximately 600 cu. yd. Since its facilities had always been entirely adequate for the winter months, when the ready-mixed-concrete business in the northern latitudes is usually well below peak levels, it was decided to equip the auxiliary plant for mild-weather operations only. Thus, under average conditions, it is expected that the new plant will be operated from May to November, although exceptionally favorable weather, coupled with unusual demands, could upon occasion lead to extending the operating season a few weeks either way.

The auxiliary plant is located on a New York Central Railroad siding, approximately two miles from the main establishment. It is a central mixing installation built around a 3-cu. yd. Burmeister (formerly Su-Premix) tilting mixer. Last year the maximum single day's output with the new plant was 380 cu. yd. in 8 hrs., but there was abundant evidence that at least 425 cu. yd. of concrete could be produced daily whenever that amount was required.

Two men, a crane man and a plant man, can readily operate the auxiliary setup when the demand is relatively light, since the crane operator can double as a dispatcher. But when the tempo speeds up, the crane operator has a full-time job, and it is then necessary to bring in a third man to do the dispatching. Experience to date indicates that two men can readily handle the operations at any demand level up to approximately 200 cu. yd. per day.

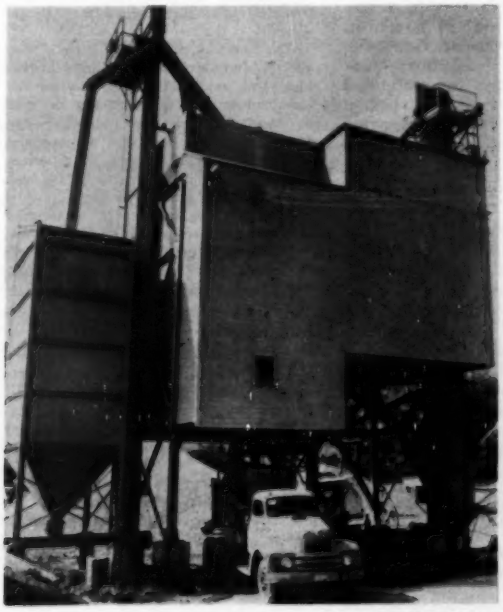
In practice the manpower problem has been solved by having a two-man crew, hired on a 9-month work guarantee, permanently stationed at the new plant throughout the operating season. During slack periods, and on days when the plant may not be operated at all, these men look after maintenance and repair work, and also take care of routine clean-up, painting and similar duties. When a third man is required for operations, he is sent from the main plant.



The control consol and dial scales on the batching floor of the new plant. Intercom system connects with the plant office.

Although the rail siding is available for bringing in materials, to date all of the aggregates (crushed stone and sand and gravel) and a major portion of the cement have been delivered in trucks. Aggregates are stored in open piles by means of a crawler crane, and are reclaimed with the same equipment. The four-compartment 175-ton aggregate storage bins are charged by means of a bucket elevator and a turnhead.

The cement storage system consists of two overhead bins holding 125 bbl. each and a ground-level single compartment bin, which holds



Left: Close-up of the plant showing the single-compartment 475-bbl. bin for cement storage. Two 125-bbl. compartments in the main bin structure provide for live storage of cement.

Below: We noted this unusual concrete transfer operation at the main plant. Many small users prefer to have their own trucks loaded in this fashion, thus avoiding a penalty charge for tying up one of the big transmit-mix trucks.

One of the company's trucks at the new plant office. Delivery units switch from one plant to the other in accordance with hour-to-hour requirements.

approximately 475 bbl. A single screw conveyor and bucket elevator provides for filling these units from either railroad cars or trucks, as well as for the transfer of cement from the ground-level to the overhead compartments.

Aggregates and cement are carefully weighed in accordance with prevailing good practice, while the mixing water passes through a Neptune meter which cuts off automatically when the desired number of gallons has been measured out. A somewhat unusual feature of the plant, although standard with Burmeister installations, is the package hydraulic system which provides power for tilting the mixer and for opening and closing the bin gates. The mixer is described as being an integral part of the plant structure and a feature of the tilting action is that less headroom is required than for most installations of equal capacity.

The company operates about 25 T. L. Smith truck mixers of 3- and 4-cu. yd. capacity, and these units are freely interchanged between the two plants. All orders are received initially at the main plant, and those which can best be handled from the auxiliary establishment are relayed by telephone. The point of delivery is the determining factor for the vast majority of orders, since the new plant is both equipped and supplied to take care of just about any order that can be handled at the main plant. The north side property has a small dispatcher's office and is equipped for two-way communication between the office and the batching floor.

Some miscellaneous operating practices at the auxiliary plant may be of interest. Darex A.E.A. is used in all batches unless some alternate means of air entrainment is specified by the purchaser. Additions of the admixture are made by means of an automatic dispensing device. We noted that mixing time for the average batch runs around 1¼ minutes, and the total elapsed from the moment of arrival to the moment of departure for a 4-cu. yd. truck runs around 5½ minutes. When the plant is busy, it is the practice to flush out the central mixing drum only at the close of the work day, whereas this operation may be performed several times in the course of a day if relatively few trucks are loaded at widely spaced intervals.

The auxiliary plant is fully enclosed in the sense that all parts of it are adequately protected from the weather. When operations are suspended for the winter months, the open portions around the tilting mixer are boarded up, mainly for the purpose of protecting the property from vandalism.

After almost a full season's operating experience Erie's management feels that the decision to establish a second plant was entirely sound. Although the main plant still handles the bulk of the company's business, the load it must carry has been materially lightened. During periods of peak demand in 1951 it was often necessary to operate 11 or 12 hours a day, whereas last summer, with the auxiliary plant in operation, an 8¼-hr. day was the rule. This change has not only eliminated a good deal of costly overtime, but it has also shown evidence of resulting in better workmanship at all levels.

Of at least equal, or perhaps even greater, importance is the undeniable fact that the company's customers are well pleased with the speedier and more dependable service they now receive. And finally, of course, the auxiliary plant enables Erie to handle orders which the company could not safely have accepted under the old setup. Last summer, for example, a 9,000-cu. yd. job was handled from the north side plant which it would have been out of the question to attempt from the main plant.

Erie is engaged only in the production and sale of ready-mixed concrete and directly related supplies. Walter Fishering is president, treasurer, and general manager of the company; Richard H. Rogers is vice-president and general counsel; and James R. Fleming is secretary. Operations at both plants are under the direct supervision of James R. Mills.

Preload Engineers, Inc. Open Offices in Arlington, Va.

Preload Engineers, Inc., newly-established firm of consulting engineers in prestressed design, announce the opening of their offices at 955 North Monroe Street, Arlington, Va.

This new firm, formed from the Preload Company, Inc., pioneers in prestressing in North America, was established to provide an organization concerned solely with the design of prestressed structures such as buildings, bridges, tanks, pipelines, and pavements.

In its designs Preload Engineers, Inc., will make use of the method or methods of prestressing which are best adapted to the specific problem in hand. The firm will also advise its clients on the suitability, practicability, and availability of the various materials used for prestressing, as well as any specialized construction procedures which may be involved.

The services offered by Preload Engineers, Inc., include preliminary inspection and reports; preparation of detailed plans and specifications for construction; estimates of quantities and costs; analysis of bids and assistance in letting contracts; inspection, consultation, and advice during construction; and such other activities as may be desired by its clients in accordance with established professional practice for civil engineers.

Senior members of the new firm are Curzon Dobell, E. H. Thwaits, Cedric C. Stainer, and Eric Molke.

Los Angeles Builders Plan Permanent Materials Mart

The Building Materials Mart, a permanent building materials exhibit planned by the Contractors Safety Association Los Angeles, will be located on the ground floor of 5850 Wilshire Boulevard.

Exhibit space, it has been reported, will be available on an annual basis upon application to the association at 324½ S. La Brea Avenue, Los Angeles. Makers of concrete products in the area should find this a fine promotional opportunity.

Toledo Block Firm Uses Oil-Fired Industrial Heater in Curing Process

another ON THE SPOT report

IN a comparatively short period of time Superior Building Products Inc., Toledo, Ohio, has become an integral part of a rapidly expanding residential community situated in the extreme northern part of Toledo. Founded in 1946, this

By KENNETH A. GUTSCHICK

progressive firm produces concrete block, both heavyweight and lightweight, and also handles a complete line of masonry materials and equipment. Judging from its size, service area, and type of business, the firm represents a typical small-town building material concern, which performs an important service to the community.

The organization is housed in a 50- by 162-ft. concrete block building, with the block plant located to the rear of the building supply office. The block plant is equipped with a GoCorp vibrating block machine, and production averages approximately 440 8-in. equivalents per hour. The building also has two small curing rooms and a storage area for bagged cement, aggregates, and blocks.

An outstanding feature of the plant is found in the block curing operation, where heated air, rather than conventional live steam, is used. The heated air, reaching a temperature of approximately 160 deg. F., is supplied by a Prat-Daniel Thermobloc, an oil-fired industrial heating unit. It is located in the corner of one of the kilns but serves both of them. A small amount of moisture is added to the kiln during the curing cycle by means of a spray nozzle. According to Superior officials this method of curing has proved to be both efficient and economical, and their masonry units easily meet local and state specifications.

All materials, including crushed stone (No. 6, 7, and 8 sizes), No. 2 torpedo sand, cinders, and bagged standard portland cement, are trucked in from nearby sources and stored in the block plant. Thus aggregates are kept from freezing during the winter months. The only additive used is calcium chloride (2 percent), and that only during the winter.

General view of Superior Building Products, Inc., Toledo, Ohio. Block plant is located to rear of building supply office.

Aggregates are transferred from covered storage to a Stearns 18-cu. ft. mixer by a Ford tractor equipped with a Wagner 1/3-cu. yd. scoop, while cement is fed to the mixer by hand. After mixing, the material is discharged into an electrically-operated skip hoist and elevated into a 40-cu. ft. hopper over the block machine. An average mix at the plant yields 24 8-in. block per sack of cement.

The GoCorp Junior Twin, cored pallet, automatic block machine mentioned earlier was installed in the summer of 1949. It is believed to be the first machine of that particular model to be placed in service. Two men operate the block-maker—one to insert the cored pallets in the mold box and the other to operate the basket-type off-bearer. Both cast-iron and pressed-steel cored pallets are used. Air pressure for operation of the off-bearer and for general cleaning of the block machine is generated by a Curtis compressor mounted adjacent to the GoCorp unit.

Officers of Superior Building Products, Inc., are (left to right) Harry Deshler, president; Kathryn Deshler, secretary-treasurer; and John Kjoller, vice-president.

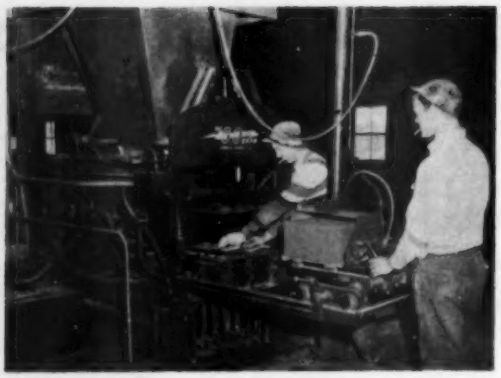
The basket-type off-bearer at the Superior plant was specially designed by Harry Deshler, company president, at the time of installation of the block machine. Use of this type off-bearer, rather than the spade-type, enabled the firm to continue using their original group of racks instead of purchasing new ones.

Mr. Deshler also designed a special detachable metal frame for one of the firm's industrial trucks, which is used in changing the mold boxes in the block machine. This is an important feature since changeovers are made quite frequently. Block sizes made includes 4-, 6-, 8-, and 10-in. cored units, 4-in. solid units, and specialties.

The molded units are loaded on four-tiered cast-iron racks, 48 8-in. units to a rack, and then transferred to the two curing rooms by a gasoline-powered Model D Truck-Man.

The kilns, located side by side, are 7 1/3 by 14 by 27 ft. and 7 1/3 by 14 by 46 ft. in size; they have a combined capacity of 2,700 8-in. units. To minimize radiation losses, the kiln ceilings are made of ¾-in. pressed wood sheathing, topped with a 4-in. layer of granular vermiculite. The underside is coated with an asphalt base paint. The kiln walls, made of cinder block, are coated with a heavy portland cement base white paint. The doors, constructed

Aggregates are taken to the mixer by means of a tractor equipped with a 1/3 cu. yd. scoop.



The automatic vibrating cored-pallet block machine produces 440 8-in. units per hour. Note basket-type off-bearer.

of corrugated aluminum, are hinged at the top and pulley-operated.

As mentioned earlier, the block are cured through use of heated air, augmented by a fine water spray. Live steam is not used. The source of heat is an automatic, model 200 Prat-Daniel Thermobloc, which was installed in May of last year. This industrial heater has a gun-type oil burner and uses No. 2 oil; oil consumption averages 1.75 g.p.h. The heat output is 200,000 B.t.u.'s per hr. and air is circulated at the rate of 2,400 c.f.m. The heater is very compact, measuring 28 by 28 by 84 in. When it is located in the kiln, as at the Superior plant, it occupies the space of only one rack.

The Thermobloc is mounted in the corner of the larger kiln, along the wall common to both kilns (see photo). Four openings in this wall (two at the top and two at the bottom) permit ample circulation of heated air to the smaller kiln.

In the actual curing cycle, the Thermobloc is operated from 4 to 8 hours, the exact length of time depending primarily upon the weather. The blocks are loaded in the kiln during the day, and the heater is turned on late in the afternoon. The kiln temperature gradually increases and attains a maximum of approximately 140-160 deg. F. before the unit is shut off. The blocks are removed the following morning. An 18-in. exhaust fan located in the larger kiln ventilates both kilns after the doors are opened.

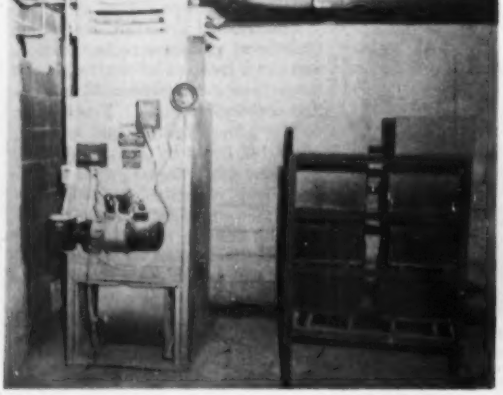
For several months after the Thermobloc was installed, the curing was accomplished without the addition of moisture. The moisture contained in the molded units was sufficient to do an adequate job of curing. Early block tests bore out this fact. However, consistent with the progressive nature of the Toledo firm, the owners recently began experimenting with the use of water spray, with the objective of producing an even better block. A Spraying Systems ¼-in. Tee Jet nozzle was installed on the ceiling of each kiln, approximately 2 ft. from the louvered outlets of the Thermobloc. Thus the spray is circulated by the heater along with the heated air. The general practice at the present time is to turn on the spray after the kiln temperature has reached 110 deg. F. and to keep it on until the heating unit is turned off.

Recent seven-day and fourteen-day strength tests indicate that the addition of the water spray has resulted in a slightly higher compressive strength than previously attained. An average seven-day test on an 8-in. heavyweight block showed 864 p.s.i. gross area and a 14-day test of 1,405 p.s.i. However, the owners point out that these results are not to be taken as conclusive.

(*Continued on page* 242)

Left: Kiln temperature is raised to 160 deg. F. by means of an oil-fired industrial heater located in the corner of one of the two kilns. Spray nozzle attached to ceiling provides additional moisture for curing.

Right: Industrial lift-truck used to transfer loaded racks to the kiln.



Smart Promotion Plus Integral Marble Facing Creates New Markets for Block

By JOHN P. FLYNN

AT most recent gatherings of concrete masonry producers there has been considerable discussion of ways and means of glamorizing the basic masonry unit in order to open and develop new fields of application, as well as to consolidate and strengthen existing markets. While the idea is easily as old as the product itself, it seems to us that in the last few years more fresh thinking and real ingenuity have been brought to bear on the problem than in all the previous long history of the industry.

We devote considerable space to such endeavors because of our conviction that in the long run they all contribute some additional measure of versatility to an already amazingly versatile material. A relatively new development of this kind, and the subject of this report, has already found acceptance in the New York area, one of the nation's more conservative building markets. It is reported here in considerable detail because we believe it offers interesting possibilities to block makers, providing them with an essentially new product by means of a relatively simple extension of the normal production cycle.

Labelled "marble face block," by the men who developed it, the new product consists of conventional concrete (or cinder) block, to which is bonded a smooth, colorful face of marble aggregate concrete. The new unit provides an excellent example of how product improvement, combined with modern merchandising, can open up substantial new markets for the industry.

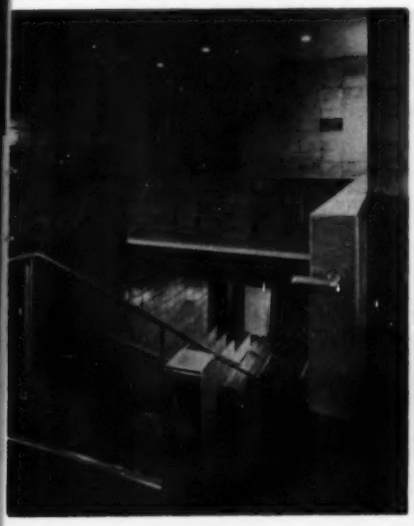
With its smooth, shiny surface and accurate dimensions, the marble-face block is a building material that provides a finished wall in one standard masonry operation. Made in all standard sizes, types, and specialties, it has the rich, warm effect of natural stone in its color shading and texture. Color and texture are the result of combining marble chips with natural oxide pigments in the mix. The marble face can be applied to both sides of the units in a single operation.

During the last few years, marble-face concrete block have been successfully installed in some 200 projects ranging from modest homes to huge buildings. Churches, factories, schools, apartments, terminals, stores, and restaurants are among the many types of structures which have been built with the units. Prominent architects have specified them for a wide range of purposes—functional, utilitarian, and aesthetic alike. They are used for interiors and exteriors, for stairwells and corridors, lavatories, laboratories, and many other purposes.

The Port of New York Authority, reputedly one of the most exacting buyers of building materials in the nation, is currently using marble-face concrete blocks as major elements in the erection of two of its most important projects. The shop area of a huge new hanger at Idlewild, New York International Airport, is completely enclosed with some 80,000 sq. ft. of the product. For an entirely new terminal at Newark Airport, the Port Authority has specified 40,000 sq. ft. of single-faced block for internal corridors. In addition, the enclosed passenger arcades that lead from the terminal building to the flight lines are being built entirely of double-faced 8-in. units which are tan inside and gray outside.

New York Central Railroad has used marble-face concrete block for some 25 different building projects over the last two years, and the University of Pennsylvania used 80,000 sq. ft. of the units for the hallways of the Wharton School of Business. Other prominent users include the Archdiocese of New York, Johnson & Johnson, Corning Glass, Alcoa, Colgate-Palmolive-Peet, W. T. Grant, and Bendix Aviation.

Marble-face block can be laid up just about as easily as ordinary block, one noted authority reports. He is John A. Mulligan, president of the Associated Brick Mason Contractors of Greater New York. Voicing his approval of the substantial cost saving features that this new type block offers, Mr. Mulligan points out that an important advantage results from the ability to erect double-faced walls, built by masons working simultaneously from scaffolding on both sides of the wall. Thus the labor and material saving features of exposed



LEFT: Faced masonry units used in this stairwell of a Jersey City railroad terminal were produced by Marble Face Blocks, Inc., Kenilworth, N. J.

RIGHT: Bands of white marble-face blocks divide area of red units in the central tower of this modern industrial office building.

concrete masonry are combined with the beauty of a harmoniously colored, sanitary surface in the erection of a load-bearing wall that requires no further attention, once erected. Savings are said to range from 30 to 50 percent over comparable methods of wall construction.

The marble-face block is a child of modern merchandising. Developed to meet a definite, specific need, the unit was first tested and proved in use before being offered commercially. Then it was sold to the key elements in the building market—architects, designers, engineers, and contractors. Direct selling, mail selling and printed literature have been used in the initial effort. On-the-spot inspection of actual installations is, of course, the best selling technique for such a product, but scattered installations make this difficult.

One of the newest tools of selling—the stereo slide projector—has also been used to good advantage to show prospects vivid three-dimensional pictures of the product in use.

But the merchandising of marble-face block does not cease when the material has been specified by the architect. The men supervising the actual building are visited to spread the gospel of careful handling and careful laying up. These on-the-site sessions drive home the fact that even though the marble-face block is a concrete masonry product that can be laid by ordinary masons, it must be given the careful handling required for any finished facing material if best results are to be achieved.

The block used in all the initial installations in the New York area have been manufactured by Marble Face Blocks, Inc., at a pilot plant in Kenilworth, N. J. Here C. B. Locklin, vice-president, who supervises production and development, has perfected for commercial application the process originally developed and patented by J. A. Knighton.

This process applies basic principles familiar to all block manufacturers. Before material is fed into the mold box of the block machine, the operator inserts a pan containing a wet concrete mix of marble aggregate and pigment which has been previously vibrated. The basic block material is then fed, and the block is made against the marble face. After tamping, the block is cured in accordance with conventional block plant procedures. The metal pan is then removed, leaving a conventional block with a completely finished marble concrete face. Corner blocks, double-faced blocks, and other specialties are produced in one operation following the same procedure.

Mr. Locklin, formerly manager of concrete manufacturing operations for Frederick V. Lawrence, Inc., in

(*Continued on page* 250.)

This 850-ft. wall at Idlewild International Airport is the front of the hangar shops area, which is being enclosed with 80,000 sq. ft. of marble-face units.

LEFT: Soldiered white units create an interesting effect in this modern entrance arcade for a new Johnson & Johnson plant at Metuchen, N. J. RIGHT: Stripping one of the faced units from a tamp machine at the plant in Kenilworth, N. J. The face pan shown here remains in position throughout the ensuing curing cycle.

Ready Mix Association Conducts Survey of Cement Supply Situation

LATE last year the National Ready Mixed Concrete Association mailed questionnaires to its members in an effort to determine the extent and severity of cement shortages in 1952, and the likelihood of a recurrence of such shortages in 1953. Replies received from 277 concerns operating in 46 states represent a 51 percent return from active member companies. As a result of this exceptionally fine response it is felt that the findings should present a more than usually reliable picture of the situation.

Three tables have been prepared and distributed, showing various aspects of the situation as revealed by the survey. These, along with the analysis sent out by the association, are reprinted here in order to give the widest possible circulation to the information. The tables and the memorandum were prepared by Kenneth E. Tobin Jr., assistant executive secretary of the association.

Table 1 enumerates the nature, severity, and location of cement shortages which occurred during 1952. Of the total number of reporting companies, 144 (51 percent) advised that they experienced serious cement shortages during 1952; 124 of these firms (86 percent) experienced a loss of production as a result of the shortage; and 92 of the companies (64 percent) were forced to shut down their operations for an average of 13 days during the year due to lack of cement.

The 688,500 cu. yd. of production which these companies estimated was lost because of the shortage does not represent the full magnitude of the industry's loss; a considerable number of the reporting companies failed to make an estimate of yards lost, and many companies adopted a policy of supplying regular customers and could not reflect in their estimate the business which was lost because new or irregular customers had to be turned down.

The 688,500 cu. yd. represents a gross dollar loss of $7,731,855 based on the average value of $11.23 per cu. yd. reported in the association's annual production and value survey[1] earlier this year. The estimated gross dollar loss likewise does not reflect the full amount of the industry's dollar loss, since it does not take into account the increased costs which a large percentage of the companies incurred because they were forced to purchase out-of-area cement and were unable, to a large extent, to pass this increased cost along to their customers. Likewise it does not reflect completely the increased cost per cu. yd. of wages and the like which results from operating at less than normal production.

Ninety-six percent of the companies reporting shortages in 1952 listed one or more of three reasons for the shortage: (1) inadequate cement production for the area's normal requirements; (2) strikes; (3) railroad car shortage. Of the 144 companies reporting 1952 shortages, 117 companies (81 percent) indicated that cement production for their area's normal requirements was inadequate; 66 companies (46 percent) indicated that strikes were responsible for the shortage; and 32 companies (22 percent) felt that railroad car shortage was a principal cause.

Table 1 reveals that the shortages occurred in well-defined areas. The shortage was felt largely in states east of the Mississippi and western states bordering on the Mississippi. No shortage was reported in the 11 westernmost states.

The shortage was not acute, except in isolated instances, in the southern states. Florida, where the situation has been very bad for several years, was a notable exception. However, certain areas of Texas, Louisiana, Arkansas, and North Carolina reported shortages.

Without exception, the reporting companies in the following states reported severe shortages: the New England states, Delaware, Michigan, and Kentucky. More than 50 percent of the reporting companies in the following states reported serious shortages: New York, Ohio, Indiana, Wisconsin, Minnesota, and the District of Columbia. While the ce-

Survey of Cement Supply in 1952 and Prospective Supply in 1953

Table 1: Cement shortages in 1952 and reasons for the shortage.

State	Number of Reporting Companies	No. of Companies with 1952 Shortages	Loss of Production			Plant Shut Down		Reasons for Shortage of Cement			
			No. of Companies	Cu. Yds. of Concrete Lost	Average No. of Days Affected	No. of Companies	Average No. of Days Lost	Normal Production Inadequate	Strikes	Railroad Car Shortage	Other Reasons
Alabama	3	0									
Arizona	2	0									
Arkansas	8	6	3	-----	90	1	14	3			
California	18	0									
Colorado	3	0									
Connecticut	2	0									
Delaware	1	1	1	-----	60	1	12	1			
Florida	10	10	8	14,000	98	4	12	8		1	
Georgia	6	0									
Idaho	1	0									
Illinois	12	6	5	28,000	65	5	10	5	4	3	1
Indiana	10	9	8	64,000	85	5	12	7	5	4	1
Iowa	14	5	5	9,500	26	5	8	3	1	2	
Kansas	4	0									
Kentucky	2	2	2	9,000	82			2			
Louisiana	2	1			60			1			
Maine	0	0									
Maryland	6	3	3	21,000	45	1	20	3			
Massachusetts	9	9	8	15,000	35	5	5	9	2	6	1
Michigan	13	13	13	101,000	73	9	10	11	12	4	1
Minnesota	9	7	7	17,000	65	7	9	4	5	3	
Mississippi	2	0									
Missouri	5	1	1	5,000	60	1	7	1			
Montana	1	0									
Nebraska	1	1	1	-----	90				1	1	
Nevada	1	0									
New Hampshire	1	1	1	1,700	60	1	20	1			
New Jersey	10	6	5	14,000	36	3	7	6	2	2	
New Mexico	2	0									
New York	8	7	5	69,000	60	3	13	7	1	1	
North Carolina	4	1									
North Dakota	1	1	1	4,000	60	1	10	1	1		
Ohio	24	19	16	179,000	60	14	11	17	17	5	
Oklahoma	1	0									
Oregon	4	0									
Pennsylvania	25	12	12	31,000	65	9	9	6	9	7	
Rhode Island	2	2	2	19,000	62	2	22	2			
South Carolina	1	0									
South Dakota	3	2	2	3,000	22			2			
Tennessee	2	0									
Texas	20	6	4	19,000	80	3	29	4			
Utah	1	0									
Vermont	1	1	1	-----	60	1	10	1			
Virginia	2	0									
Washington	5	0						1			
West Virginia	2	1									
Wisconsin	11	7	7	51,000	111	7	11	6	5	2	2
Wyoming	0	0									
Dist. of Col.	4	3	2	5,000	67	1	7	2	1	2	
Hawaii	1	0									
Alberta, Can.	1	1	1	10,000	60	1	35	1			
Totals	277	144	124	688,500	63	92	13	117	66	32	6

[1]See *Production and Value of Ready Mixed Concrete in 1951*, THE CONCRETE MANUFACTURER, September, 1952, page 201.

ment supply situation was mixed as to certain areas in the following states, there were nonetheless reports from some companies of serious shortages: New Jersey, Pennsylvania, Maryland, West Virginia, Illinois, Iowa, and Missouri.

The survey findings indicate also that ready-mixed-concrete producers in North Dakota, South Dakota, and Nebraska were troubled with cement shortages in 1952, and the only report from Canada showed a severe shortage in Alberta.

Table 2 indicates the months in which the shortages occurred in 1952. In general, the shortage began in June and became progressively severe until October, tapering off through November and December. Shortages were reported on the widest scale in September and October.

Table 3 summarizes the estimates of the reporting companies of prospective cement supply in 1953. In general, the same areas experiencing shortages in 1952 expect a shortage in 1953. However, it will be noted that more companies expect a shortage in 1953 than actually experienced a shortage in 1952.

This is largely due to the uniform expectation of cement shortages in Ohio and the Middle Atlantic states, where large construction projects will require greater quantities of cement. Ready-mixed-concrete producers in Ohio, West Virginia, Kentucky, Indiana, and southern Michigan expect to have serious difficulty in obtaining cement in 1953 because of extraordinary cement requirements for the construction of an atomic energy plant in Ohio and the Ohio Turnpike. New York will have a large highway building program in 1953, including the New York Thruway, which will affect the supply of cement for ready-mixed-concrete producers in the New England states, New York, New Jersey, Eastern Pennsylvania, Delaware, Maryland and the District of Columbia.

Survey of Cement Supply in 1952 and Prospective Supply in 1953

Table 3: Cement supply outlook for 1953

State	No. of Companies Expecting No Shortage in 1953	Companies Expecting 1953 Shortage	Increased Demand for Cement	Inadequate Production for Area's Normal Needs	Railroad Car Shortage
Alabama	3	0			
Arizona	2	0			
Arkansas	4	2	2		
California	18	0			
Colorado	3	0			
Connecticut	0	2	2		
Delaware	0	1	1	1	
Florida	0	10		10	
Georgia	6	0			
Idaho	1	0			
Illinois	4	8		8	2
Indiana	1	9	3	7	1
Iowa	9	5		5	
Kansas	4	0			
Kentucky	0	2	1	1	
Louisiana	2	0			
Maine	0	0			
Maryland	3	3	1	2	
Massachusetts	0	9	9		
Michigan	0	13	4	12	
Minnesota	2	7	4	4	
Mississippi	2	0			
Missouri	4	1		1	
Montana	1	0			
Nebraska	0	1	1		
Nevada	1	0			
New Hampshire	0	1	1	1	
New Jersey	0	10	10		
New Mexico	2	0			
New York	1	7	7		1
North Carolina	3	1	1		
North Dakota	0	1	1	1	
Ohio	0	24	23	2	
Oklahoma	1	0			
Oregon	3	1	1		
Pennsylvania	6	15	14	1	1
Rhode Island	0	2	2		
South Carolina	1	0			
South Dakota	1	2		2	
Tennessee	2	0			
Texas	14	6	1	5	
Utah	1	0			
Vermont	0	1		1	
Virginia	2	0			
Washington	5	0			
West Virginia	1	1	1		
Wisconsin	3	8	4	6	
Wyoming	0	0			
Dist. of Col.	1	3	1	1	1
Hawaii	1	0			
Alberta, Can.	0	1		1	
Totals	118	159	95	72	6

Survey of Cement Supply in 1952 and Prospective Supply in 1953

Table 2: Months in which shortage occurred in 1952

State	Number of Companies Reporting	Number of Companies Reporting Shortage in Month Listed Below												No Shortage Reported
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Alabama	3													3
Arizona	2													2
Arkansas	8							1	1	1	3	2	2	2
California	18													18
Colorado	3													3
Connecticut	2													2
Delaware	1										1	1	1	0
Florida	10	1	1	1	1	3	5	6	6	6	6	7	4	0
Georgia	6													6
Idaho	1													1
Illinois	12							2	7	7	5			4
Indiana	10						2	4	3	5	7			1
Iowa	14								2	5				9
Kansas	4													4
Kentucky	2								1	2	2			0
Louisiana	2								1	1	1			1
Maine	0													0
Maryland	4					1				1	3	1		2
Massachusetts	9								2	6	6			0
Michigan	13						1	4	8	9	8	2		0
Minnesota	9						1	2	3	5	5	2		2
Mississippi	2													2
Missouri	5									1	1			4
Montana	1													1
Nebraska	1							1	1	1				0
Nevada	1													1
New Hampshire	1									1	1	1		0
New Jersey	10									3	5	4		6
New Mexico	2													2
New York	8						1	2	4	6	5	4		2
North Carolina	4								1	1	1			3
North Dakota	1							1	1					0
Ohio	24				2	4	7	9	15	18	16	5		5
Oklahoma	1													1
Oregon	4													4
Pennsylvania	15						1	7	6	4	6	5	2	9
Rhode Island	2									2	2			0
South Carolina	1													1
South Dakota	2								1	2	2	2		1
Tennessee	2													2
Texas	20			1	1	3	4	3	4	4	5	4	1	14
Utah	1													1
Vermont	1										1	1		0
Virginia	2													2
Washington	5													5
West Virginia	2										1			1
Wisconsin	11						4	4	5	6	6	4		6
Wyoming	0													0
Dist. of Col.	4									3	3	2		1
Hawaii	1													1
Alberta, Can.	1								1	1				0
Totals	277	1	1	2	4	11	39	43	68	100	112	77	13	143

The construction projects referred to above, together with anticipated increases in total construction volume in many areas, caused 95 of the reporting companies to report that the expected cement shortage in 1953 will be primarily a reflection of increased demand for cement. Inadequate production of cement for normal requirements of the area is cited by almost half of the companies (72) as the basis for expecting a shortage in 1953. Only six companies believe that railroad car shortages in 1953 will be responsible for a shortage of cement.

Sell Mich. Ready-Mix Plant Owners Open Fla. Firm

The White Pigeon Redi-Mix, Sand and Gravel Company, White Pigeon, Mich., has been sold to Don Aldrich, Ben A. Jensen and Mrs. Gloria Brown. The company will be renamed Aggregate Processors, Inc.

The plant has a capacity of 250 cu. yds. of ready-mixed concrete daily and also produces washed sand, gravel, and other aggregates.

C. R. and E. H. Joelson, the former owners, have opened the Venice Redi-Mix Company in Venice, Florida. The new owners of the White Pigeon plant have been associated with it in executive capacities.

UNIVERSAL CONCRETE PIPE CO. OPENS NEW PLANT IN MIAMI AREA

By W. M. LAFFERTY
Plant Manager,
Universal Concrete Pipe Co.

ONE of the outstanding recent installations in the concrete pipe industry is the new plant constructed by the Universal Concrete Pipe Company at Dania, Florida. The plant is situated just west of Dania (near Miami) on a 12-acre tract adjacent to the Seaboard Railroad. It will serve the Miami area and all southern Florida by truck or carload shipment.

H. X. Eschenbrenner, president and founder of the Universal Concrete Pipe Co., officially opened the plant at an open house on January 10th. It was a gala affair attended by over 500 state highway officials, mayors, contractors, architects and engineers. Food and refreshments of all kinds were served throughout the afternoon. Music was furnished by a four-piece band, and the entertainment was climaxed by an hour-long performance by the hilarious television artists, "The Vagabonds."

A complete display of products manufactured was arranged and conveniently located with descriptive literature for each product. Various types of special equipment, long length forms and molds were on exhibit. A unique stage setting for the entertainers was constructed entirely of Flexicore floor slabs, with concrete pipe placed in such a way as to form a background. Concrete pipe ranging from 4 to 78 in. in diameter, and weighing from a few pounds to several tons per joint, were in the foreground.

W. M. Lafferty, manager of Universal Concrete Pipe Company's new Miami-area plant, cuts cake at recent Open House. At left and right are H. E. Eschenbrenner, Universal's executive vice-president, and J. R. Stewart, City Manager of Dania, Florida.

The new building, 26th in the Universal chain, is approximately 90 percent completed. It is constructed of steel and metal and covers a floor area of 17,200 sq. ft. The manufacturing room, where a substantial amount of machinery will be placed, is 40 by 160 ft., with an elevation of 30 feet. There are four drying rooms, 20 ft. wide and 60 ft. long for concrete pipes. Two drying rooms, 40 by 60 ft., are for drying long lengths of Flexicore. All drying rooms are built of concrete block and Flexicore roof.

H. X. Eschenbrenner, president of Universal Concrete Pipe Co., accompanies "The Vagabonds" at opening of Universal's new Miami-area plant.

A 42-cu. ft. concrete mixer, serving the one pipe machine now in operation, is installed in a floor pit, so it can be fed by gravity or from a travelling weighing device. The completed mix is elevated to the machine hopper or feeder by a skip-hoist at the rear of the machine. The pipe machine employs the tamping method to compact the concrete between the core and form, and it manufactures both plain and reinforced concrete pipe in sizes from 6 to 30 in. in diameter.

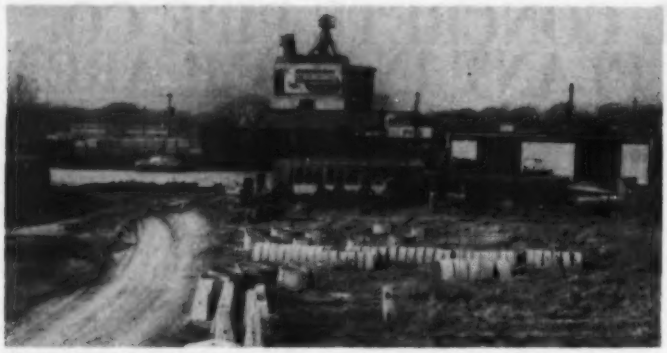
After the concrete has been placed in the molds of the machine, the finished products are removed to the drying room by rubber-tired off-bearing carts. On the smaller sizes, where weight is not a major factor, a hand buggy is provided. On the larger sizes a gasoline-powered rubber-tired unit is used.

A new and larger pipe machine will be installed as soon as the equipment arrives. This new machine will manufacture concrete pipe ranging from 24 to 78 in. inside diameter. Pipe will be manufactured in 4-ft. lengths and longer, weighing in excess of 4 tons per section. Large gasoline-driven hydraulicly operated machines will be used throughout for transferring these heavy products

(*Continued on page* 242)

Part of the crowd attending Universal's "Open House" at new Miami-area plant. Curing rooms are visible in the background.

Universal Concrete Pipe Company's new Miami-area plant at Dania, Florida.



Haydite Concrete Products plant at Kansas City, Mo., owned and operated by The Carter-Waters Corporation.

Albert R. Waters, president of Carter-Waters, welcoming guests.

Carter-Waters Promotes Use of Haydite in Prestressed Concrete

WHAT is believed to be the first attempt in the Middle-West to develop and promote the use of lightweight Haydite aggregate in prestressed concrete products of plant manufacture was undertaken recently by the Carter-Waters Corporation of Kansas City, Mo.

Licensed to use the methods and equipment of Prestressing, Inc., of San Antonio, Texas, Carter-Waters staged a demonstration of prestressing procedures for the benefit of approximately 100 engineers, architects and highway officials especially invited for the occasion.

The program, lasting from 10 o'clock in the morning until 3 o'clock in the afternoon, evolved around the various operations of precasting, prestressing and testing of a 20 foot long concrete "I" beam and a soffit block beam. On the spot tests were conducted by representatives of the Southwest Research Institute of San Antonio, Texas.

Albert R. Waters, president of Carter-Waters, welcomed the guests and expressed the satisfaction felt by his company in being able to provide facilities for an occasion that represented one of the first efforts to determine plastic flow and creep action in prestressed Haydite concrete. He presented J. J. Mennis, vice-president and general manager of Prestressing, Inc., who took the microphone to make explanatory comments over a public address system during the proceedings.

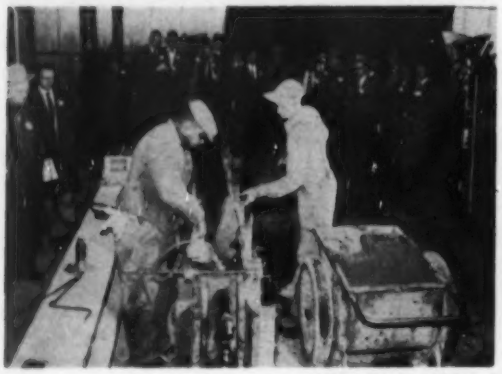
The guests watched the pouring of a 20-ft. long by 20-in. deep Haydite concrete "I" beam in prepared forms which were equipped with 1¾-in rubber hose to provide passageway for the prestressing wires. An identical cured beam was then prestressed using high-tensile-strength wire anchored at the ends of the beams with circular stressing blocks and bearing plates, using the double-headed wire method of Prestressing, Inc.

The next step was the testing of a third identical beam already mounted in a hydraulic testing rig. The beam, designed for a third-point loading of 19,500 lb., was progressively loaded and relieved to permit the observation of its recovery from hair line cracking which first appeared at 39,000 pounds Complete recovery was made from both cracks and deflection up to a loading of 39,000 pounds. At 43,000 pounds shear cracks began to develop in the web at both ends. Recovery at this point was practically, although not 100 percent, complete. Failure was finally reached at 51,000 lb., 2.65 times the designed live load.

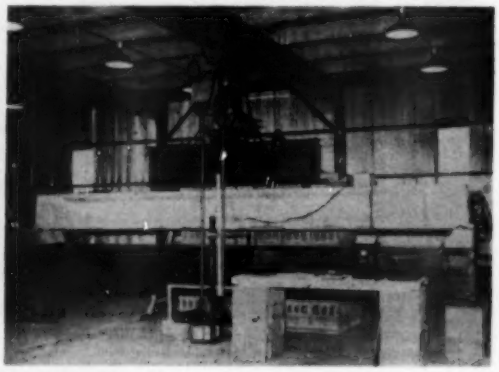
Visitors were also shown the assembling of a soffit block beam consisting of 7⅝- by 7⅝- by 21-in. soffit blocks laid 30 in a row with a thin coat of grout between the blocks

(*Continued on page* 250)

Interested spectators viewing the pouring of a 20-ft. by 20-in. concrete "I" beam to be prestressed.



Finished precast, prestressed concrete "I" beam in hydraulic testing rig ready for testing.



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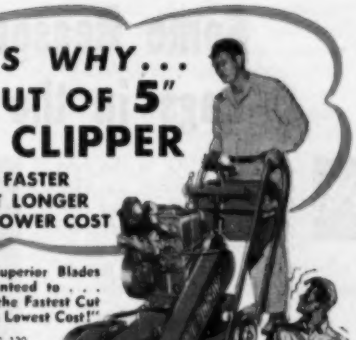

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Some Reasons Why Concrete Masonry Lags in the Home Construction Field

ACCORDING to the best evidence available, less than five percent of current residential construction consists of concrete masonry units. Undoubtedly a fair share of the responsibility for this poor showing

By NOLAN BROWNE SR.
President
Nolan Browne Co., Dallas, Texas

rests with the block industry itself for its conspicuous failure to develop an effective merchandising program in the home building field. But not all the blame can be justly assigned to the block producer, for in many sections of the country he must overcome almost overwhelming obstacles in order to market his product for home construction.

Having been in the block business since 1927 in Dallas, Texas, the writer feels justified in saying that the fault does not lie primarily in lack of interest or effort on the part of the concrete block manufacturers. There are certain very definite handicaps with which we are confronted, some of which are peculiar to this territory and some of which, although applicable in other regions, are more firmly entrenched here.

Handicap No. 1: For 50 years or more the residential construction field in Texas, Oklahoma, Louisiana, and New Mexico has been dominated by the lumber industry, the pattern for which is set by the large, wealthy "line" lumber chains consisting of as many as 90 yards. The lumber yards have practically monopolized the financing of home construction. They also finance a large proportion of residence contractors and builders, many of these men being substantially employees or agents of some lumber yard.

From the beginning the lumber people have fought masonry construction in the residential field, and to my personal knowledge they have used their tremendous hold upon the contractors and influence on the prospective builder through financing to discourage (I might almost say prohibit) the use of concrete masonry. Of course, brick and stone

Nolan Browne Sr., president of the Nolan Browne Company, Dallas, Tex.

exteriors were unavoidable, and because their principal product, lumber, could be used in large amounts when a masonry veneer was applied over a wood frame, these types inevitably became the choice of the lumber people for homes in the medium- and higher-priced brackets.

We know of many instances in which prospective builders of masonry homes were brought into contact with the lumber yard through their contractor, who needed interim financing; and there they were unsold on concrete masonry, and urged to build brick or stone veneer by the suggestion that the dealer would be more interested in financing the latter. There is still no easy way in Dallas to finance houses during construction except through the lumber yards. Banks do not as a rule handle such loans. We know of instances where banks have done so in the past and have been influenced to discontinue the practice and leave this business to the lumber people, because the latter were among the largest depositors and stockholders of the banks and exercised power accordingly on the banks' policy.

These conditions have inevitably led to a preponderance of veneered homes in this territory, except for defense and GI housing, which are predominantly of wood frame construction. For 30 or more years practically all of the better homes have been veneered over wood frame, and it is going to "take some doing" to change this entrenched buying habit.

Handicap No. 2: The Federal Housing Authority, FHA, has taken a very obstinate attitude towards any residence construction on a large scale other than wood frame or veneer over wood frame. In the report on housing made for the Senate Banking Committee by its staff headed by Joseph P. McMurray it was stated that "the FHA program was characterized by too much caution and slowness in accepting innovations and changes". We find this particularly true in our area. The Dallas office has approved a few individual houses and a few projects where Negro housing was involved. But I can say that it appears to be

Concrete masonry units, the author points out, are particularly appropriate for modern functional design, as represented by the long, low lines of this trim residence.

This attractive exposed concrete masonry church affords an excellent example of the fine workmanship which can be obtained today.

very difficult to get prior approval on a project of any size involving homes in the middle price range or better.

Some, but not nearly all, of the opposition has been predicated on the alleged sweating of masonry walls. For a number of years lightweight concrete masonry has been available economically in this territory. It has high insulating value and in this climate is wholly adequate to take care of the sweating danger without furring. However, the old requirement for furring has never been eliminated, although it has been waived a few times.

Everybody from the purchaser to the U. S. Government has been howling for lower costs in housing for the low and middle income people. Concrete masonry construction is less costly than brick or stone veneer over wood frame, and we think that it yields more long-time value in the home. The FHA practice of allowing a smaller valuation on the masonry home as compared to the same home of veneer type can only be justified up to the actual saving involved. However, many builders who preferred to build masonry homes have told me that the valuation was arbitrarily reduced by much more than the saving. This, of course, made it impractical for the builder to proceed on the basis of concrete masonry walls.

I have personally seen thousands of FHA approved homes being built in other areas, and in some places practically all middle-bracket houses appear to be constructed of concrete masonry. It is obvious then, that FHA policy is not opposed to concrete masonry in all localities, but it surely seems to be in parts of Texas.

Handicap No. 3: Veterans Administration. Just take the remarks above and magnify them and you have the VA attitude in our vicinity, particularly with regard to valuation handicaps.

Handicap No. 4: Building regulations on types of construction permitted in residential developments and additions are often established by restrictions in the deeds. It is common practice when a developer opens up a new section to have restrictions in the deeds setting forth the minimum area or value of a home to be built and also stating the type of construction.

In Dallas many such deeds require "brick or stone" exterior. It is easy to believe that this is a habit formed over the years. Also it is probable that attorneys, in writing up such restrictions, find it easier to copy some earlier covenant rather than originate new phraseology which would be more representative of modern construction. Plans frequently have to be approved by the developer. Our experience has been that he will not interpret the restriction to include full block walls.

Handicap No. 5: Banks, insurance companies, and building and loan associations which handle the final loans on completion of practically all residence construction are naturally influenced by all the above facts relating to general approval, valuation, and buying habits. Local representatives and loan officers become biased, probably unintentionally and without reasons based on fact or experience.

Those are, I believe, the reasons why the residential business of block manufacturers around Dallas does not measure up to experience in other areas. Undoubtedly, producers in other localities originally encoun-

This type of construction for medium-priced homes is virtually ruled out in some sections of the country because the policy of banks and other lending institutions is dominated by competitive interests.

tered similar handicaps and overcame them. It will take more than just complaining and excuses. It will take positive action and a lot of constructive promotion.

First, I think we should admit that there have been concrete block offered on the market in years gone by which were not of the finest appearance. The older plant equipment was not capable of producing a block as uniform and true to dimensions as is the common rule now. The old rock-faced block were certainly not things of beauty, and the workmanship of masons has not always been of the highest quality.

Modern concrete block plants now turn out high-quality block of extremely uniform dimensions. Brick masons have become expert at erecting straight and true walls and joints. They have learned this on the exposed-wall school and churches which have been built in such large numbers. Architects have learned much regarding design adapted to concrete masonry. Concrete blocks are particularly appropriate for the modern functional design.

I am well aware that both the National Concrete Masonry Association and the Portland Cement Association have spent considerable sums in promoting concrete masonry residences. I believe, however, that the situation in Texas and adjoining states warrants a more direct attack than standard advertising. I am convinced that an "on the site" campaign is necessary if we are to win, and it will take a long time to correct a situation built up over many years. Perhaps some entirely new approaches will be found necessary to smoke out FHA, VA, and some of the lending agencies.

Universal Concrete Pipe—

(*From page* 237.)

from the machine to drying rooms.

To facilitate the curing or hardening of finished products after they are placed in the drying rooms, a hot water spraying system has been installed in all the rooms. Provisions are made for the use of steam curing under adverse weather conditions. Company officials say this curing system achieves in 48 hours results equivalent to 28 days of ordinary curing.

The Dania plant will manufacture high quality precast concrete pipe with tongue and groove joints in lengths of 8 ft. or longer. Made for use with a rubber gasket or concrete mortar joint, it will be manufactured outside the main factory. Considerable area and head room are necessary for the large mobile cranes which will be used to handle this heavy product.

Pipe will be made in 24- to 120-in. diameter, ranging in weight from 1 to 17 tons per joint. Special permits are required for movement of this heavy material from plant to destination. Other items such as flat-base pipe, river weights, cribbing and bridge deck beams are standard precast products.

Equipment for manufacturing of Flexicore roof and floor slabs has been installed in the Dania plant. A large 50-cu. ft. mixer set at floor level feeds the long steel forms used in casting the joist. Overhead cranes are used for moving the heavy molds to and from the casting room. A hot water spraying system, which has proved outstandingly successful in the curing of concrete pipe, has been installed for use with Flexicore. Flexicore roof and floor slabs are a new product in Florida, but over 15,000,000 sq. ft. of the material has been installed in public and private buildings in other parts of the country.

The new Universal plant will use local materials wherever possible. Ample space has been provided for storage of sand and other materials. Carload shipments will be unloaded by a gasoline-powered clam shell. This machine will be used for stacking the finished products as well as in loading trucks for delivery to the various job sites. A fleet of heavy tractors and long semi-trailers, as well as conventional trucks, are used for delivery.

Local men will operate the machines, and stockpile the finished products. The rated capacity of the plant is well over 100 tons per 8-hr. work period. Regular operations will employ 20 to 30 men.

Universal Concrete Pipe Co., with home offices in Columbus, Ohio, is one of the largest concrete pipe manufacturers in the world. Their 26 concrete pipe plants, including four located in Florida, cover the Eastern and Southern section of the United States.

A large and well-equipped machine shop operates in conjunction with a modern steel fabrication plant for the manufacture of many types of concrete pipe machines, mold forms and other equipment. The firm is well-staffed by engineers and production specialists. A combination of highly trained personnel, years of experience in the manufacture of concrete pipe, and the successful development of machines and equipment, has brought constant growth.

Accompanying Mr. Eschenbrenner, Sr., to the Dania opening were H. E. Eschenbrenner, Jr., executive vice-president, J. C. Merritt, secretary and treasurer, T. H. Monaghan, general sales manager, and many other officials from the home office and various plants. John A. Harris, Florida district sales manager, will direct sales for the Dania plant. W. M. Lafferty is plant manager, and Francis Aumand is office manager.

Toledo Block Firm—

(*From page* 232.)

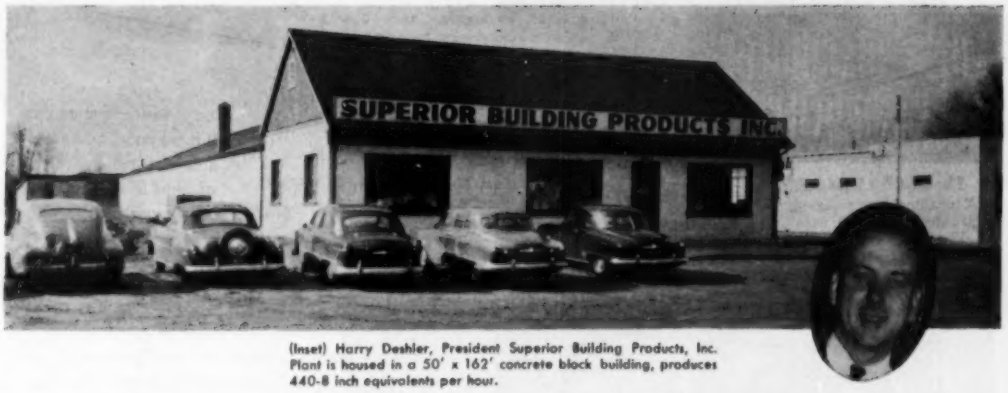
Further experimenting is to be done on this curing system in order to determine the optimum moisture condition.

After curing, the block are either transferred to the rear of the block plant or to the outside storage area, the exact place depending upon weather conditions. The outside storage area, paved with bituminous concrete, is 85 by 150 ft.—ample for the plant's production. The 4-in. block are cubed on wooden pallets, with 150 hollow units or 90 solid units to a cube. The larger units are also cubed but not on pallets. The 6-, 8-, and 10-in. units are piled in cubes of 90, 75, and 60, respectively. The block are loaded on flat-bed trucks with a gasoline-powered Towmotor fork lift truck (3-ton capacity).

The firm operates two 2-ton Studebaker flat-bed trucks for block deliveries, as well as one dump truck for aggregates. The products are generally marketed within a 20-mile radius of the plant.

Besides producing heavyweight and cinder block, Superior also makes, on order, lightweight block from air-granulated slag. Approximately 60 percent of block sales are to contractors, the remainder going to individual home owners. Due to the relatively large home owner trade and the small service area, the owners of the company are able to maintain close personal contact with their individual customers. Consequently little advertising is needed; actually the word-of-mouth type constitutes their main type of advertising.

The officers of Superior Building Products Inc. include Harry Deshler, president; John Kjoller, vice-president; and Kathryn Deshler, secretary-treasurer. The total working force numbers eight. The block plant is operated the year round.



(Inset) Harry Deshler, President Superior Building Products, Inc. Plant is housed in a 50' x 162' concrete block building, produces 440-8 inch equivalents per hour.

Stronger Blocks made without steam

THERMOBLOC Direct Fired Heater Makes

New Process More Efficient and More Economical

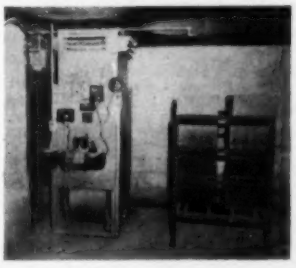
The Superior Building Products, Inc. of Toledo, Ohio, makes no secret of its production of higher tensile blocks at less cost.

Using heated air from a Thermobloc oil-fired heater, augmented by a fine water spray, the Company's method has resulted in faster, more economical curing with unloading breakage being practically eliminated.

A seven-day test on an 8-in. heavyweight block shows a strength of 864 psi gross area. A fourteen-day test of the same block shows a strength of 1405 psi.

No live steam is used in the process. Curing is accomplished through heated air furnished by a Thermobloc Heater. The compact, self-contained unit heats two kilns while occupying less space than is used by one block rack! Heat output is 200,000 btu. Air is circulated at rate of 2400 cfm. Fuel consumption averages an insignificant 1.75 gal. of No. 2 oil an hour.

For complete details on efficient, economical curing of concrete blocks, use the coupon for interesting booklet.



Model 200 Thermobloc. Unit heats two kilns. Note compactness.

THERMOBLOC ADVANTAGES FOR CURING CONCRETE BLOCKS

- Helps make stronger, more salable blocks.
- Insignificant unloading breakage.
- Low initial investment—Eliminates expensive boiler, pipe lines and installation.
- High heat efficiency—87% efficient in the above installation.
- Needs no attendant—Automatic temperature controls.
- Low operating cost. Economical clean fuel.

THERMOBLOC DIVISION

PRAT-DANIEL CORPORATION

Manufacturers of P-D Power Plant Equipment

15-5 Meadow Street South Norwalk, Conn.

Loading a 2-ton truck. Two such trucks deliver blocks within a 20-mile radius of the plant. Loading and transportation breakage is practically nil.

THERMOBLOC DIVISION
Prat-Daniel Corp.
15-5 Meadow Street, South Norwalk, Conn.

Gentlemen:

Please send me your booklet "Curing Concrete Block the Thermobloc Way."

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____ CITY_____ STATE_____

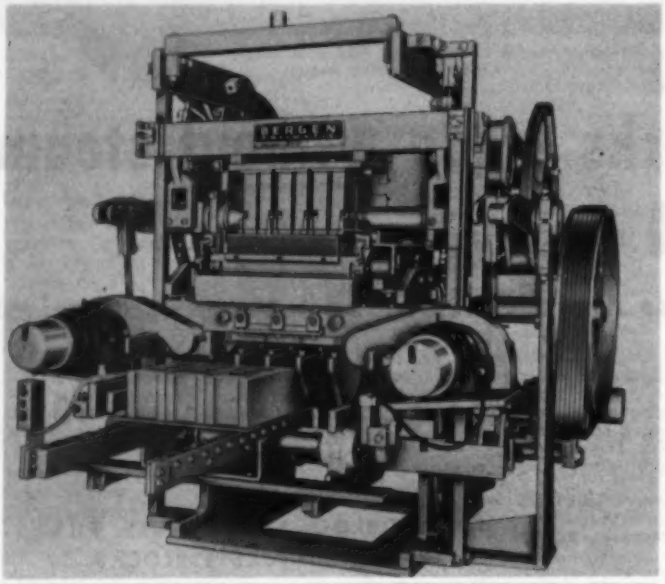
NEW MACHINERY and SUPPLIES

● Three-Block Machine

A machine that makes three blocks per cycle and from 750 to more than 900 blocks per hour has been announced by the Bergen Machine and Tool Company, 189 Franklin Avenue, Nutley, N. J.

The new block machine, the "Tri-Matic", features an outrigger bearing support, quick-change cut-off device, high speed cam design, quick-change agitator grid device, bronze guide liners, slow-moving chain with three lug links, agitator back shaft with bearings and hardened races, eccentric link with roller bearings and hardened races, and split sprockets for quick changing. The machine uses plain pallets, and is normally operated at 750 blocks per hour. However the speed may be increased by a pulley change to give more than 900 blocks per hour.

Our Identification No. 101.



● Three-ton Lift Truck

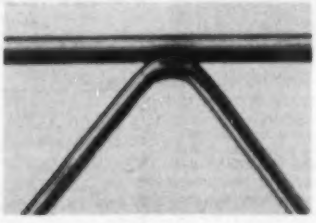
A lift truck of 6,000 lb. capacity has been brought out by the Ross Carrier Company, Benton Harbor, Mich.

The new model, the Ross "Series 6", is designed for indoor-outdoor operations. Among the features are: open tower for unobstructed visibility; single lever control for hoisting and tilting operations; four speeds either forward or reverse; pneumatic tires of the same size on all wheels for ease of driving and simplicity of stocking; and planetary gear drive in the wheels.

Our Identification No. 102.

● Joint Reinforcing

A butt-welded design for Dur-O-Wal reinforcing for masonry joints has been announced by the Cedar Rapids Block Company, Cedar Rapids, Iowa.



This design permits a truss design that is welded on a single plane for tight joints. The butt-welded design is available in

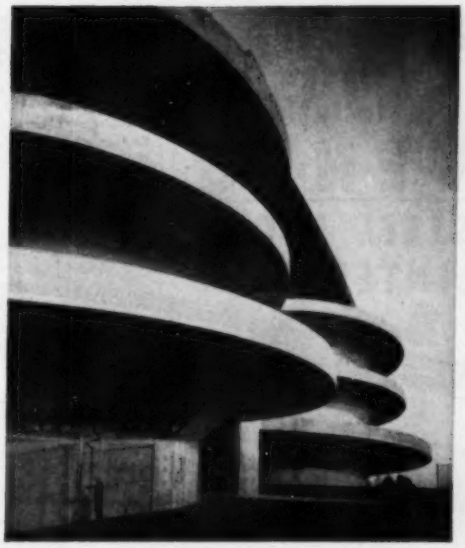
The advertisement on the right hand page, addressed to architects and engineers, appears in Architectural Record, Engineering News-Record, Western Construction and Southwest Builder.

To safeguard your investment in Truck Mixers . . .

the industry has established high standards and identifies machines which meet those standards by official Rating Plate. This *quality assurance*, to architects and engineers, is *business insurance* for every dollar you invest in truck mixers or agitators which bear the Rating Plate.

You see here two structures, designed for opposite extremes of traffic movement. The twin stadium ramps, at the right, work upward in tight spirals, at the creeping pace of crowds on foot. The freeway over-pass, below, sweeps by in the trajectory of the high speed vehicles it carries. Each is perfectly adapted to its rate of flow, and both, inevitably, are built of concrete.

Voltaire would agree that, if there were no concrete, it would be necessary to invent it. Concrete is available in abundance, relatively low in cost, strong, fire-proof and enduring. Beyond these practical virtues it has *plasticity*. To serve architects and engineers it asks only that it be well designed, correctly proportioned *and properly processed in truck mixers of certified design, capacity, mixing speed, mixing action and accuracy of water control.*



Curves—for 1 to 100 miles an hour

Photo Above: On the 15,000 seat addition to University of Washington Stadium, cantilevered spiral ramps, with elevator shaft between, meet the problem of unidirectional traffic due to lakefront location. George W. Stoddard & Associates, Architects.

Left: On Los Angeles Freeway System

Look for this Badge of Dependability on Truck Mixers:

You have a right to insist on this Rating Plate on any truck mixer that serves your jobs. It is available to all who comply with the quality standards which have been established by the Truck Mixer Manufacturers Bureau and approved by the National Ready Mixed Concrete Association.

These member manufacturers comply with Bureau standards:

Blaw-Knox Division
Pittsburgh, Pa.

Chain Belt Company
Milwaukee, Wis.

Concrete Transport Mixer Co.
St. Louis, Mo.

Construction Machinery Co.
Waterloo, Iowa

The Jaeger Machine Co.
Columbus, Ohio

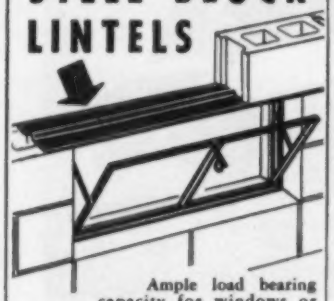
The T. L. Smith Co.
Milwaukee, Wis.

Worthington Corporation
Plainfield, N. J.

For better, stronger window installations

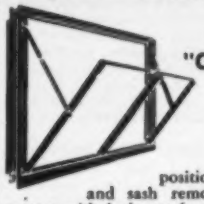
VENTO

STEEL BLOCK LINTELS



Ample load bearing capacity for windows or doors. Available from 2-ft. 6-in. to 5-ft. Formed from 10 gauge hot rolled steel with stiffening crimp in center. Beveled edge provides masonry bond and seat for mortar. Saves costs through use with standard 8-inch blocks. Vento pressed steel angle lintels for brick construction also available.

VENTO STEEL BASEMENT WINDOWS



VENTO "CHAMPION"

Three sizes. Effortless operation gives three position ventilation and sash removal. Double contact with leak-proof water-shed sill stops wind and rain. 14 gauge electric welded frame. Fins welded to jambs for easy installation in block or poured walls.

VENTO "THRIFTY"

A real economy window for lower cost housing. Three sizes, sturdy construction, smooth operation, two position ventilation and easy sash removal. Fin flanges at jambs for quick installations.

***Also** casement, utility and barn windows. Write for full information.*

VENTO STEEL PRODUCTS CO., INC.
254 COLORADO AVE. BUFFALO 15, N.Y.

standard and heavy weights for wall thicknesses from 4 in. to 13 in. Standard weight is fabricated from No. 9 rods while heavy combines 3/16 in. side rods and No. 9 cross rods.

Dur-O-Wal is manufactured at Cedar Rapids, at Syracuse, New York (Dur-O-Wal Products), and at Phoenix, Ariz., (Dur-O-Wal Div. of Frontier Manufacturing Co.).

Our Identification No. 103.

● Riveted Roller Chain

A roller chain combining the long-wearing characteristics of riveted chain and the ease of assembly of cottered chain has been brought out by Chain Belt Company, Milwaukee 1, Wis.

The chain is available as ASA standard and heavy series in 1 in. through 2½ in. pitch sizes in multiple widths. The chain is made in 10 ft. lengths with Baldwin-Rex Single Pin Couplers installed at convenient intervals so that any length can be made up without cutting rivets.

The Single Pin Coupler Link has one end firmly riveted on the adjacent link. The other contains the single pin coupler pin. This pin has one end spun over a washer and the other has a milled flat and locking pin hole. The milled flat is press fitted into the matching hole of the coupler link plate and the pin is driven the length of the milled flat.

Our Identification No. 104.

● Hydraulic Block Machine

A completely hydraulic 3-block machine has been announced by the Holland Machinery Company, Holland, Mich.

The Model "H-3" which is being sold as the "Hydro-Block" is said to be easy to operate. It is fully hydraulic and has positive height control, quality control, variable speed range, plain pallets, and optional automatic pallet return.

The machine produces 3 standard 8-in. units at a rate of four cycles a minute. The offbearer is automatic and the mold boxes can be had in completely replaceable or semi-replaceable types.

Our Identification No. 105.

● Masons' Line Block

A wooden line block for use as a block laying guide has been added to the line of block industry items made by the Gerson Company, 96 Deering Road, Mattapan, Mass.

The corner block is said to be especially useful in short wall or veneer work.

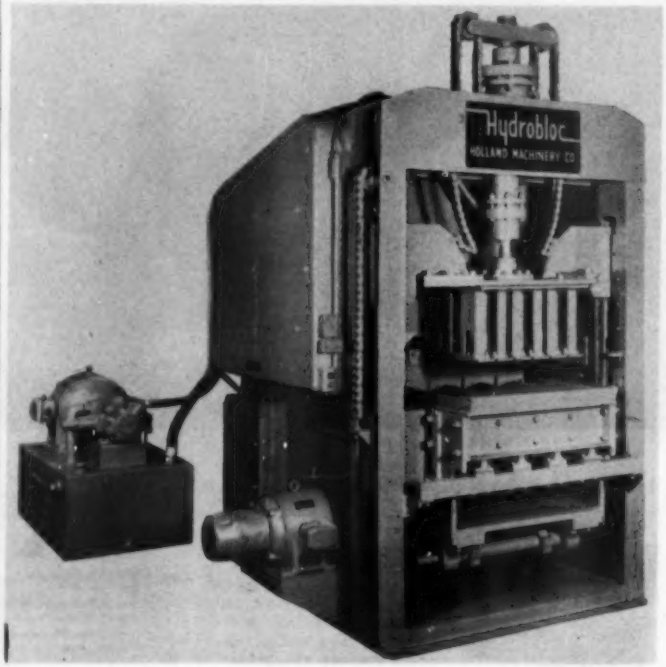
Our Identification No. 106.

● Screen Heating

New and improved heating equipment for Universal single-deck screens has been announced by the Universal Vibrating Screen Company, Racine, Wisc.

The "Unilec" equipment can be applied to new or old models and eliminates the necessity for costly insulation, provides for less power consumption, and can be installed in within two hours.

Our Identification No. 107.



Trade Literature

Krete-Koater. This four-page folder gives details of applying coatings to concrete blocks to give colored, textured, and glazed effects. The machine is described as well as the coatings available. Information on the markets for coated block, production costs and other pertinent information is included. Krete Koater Service.
Our Identification No. 108.

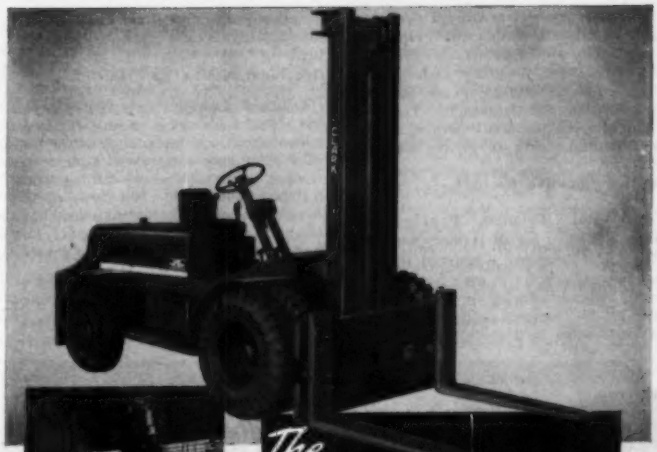
Repair Your Concrete Floors, Walls, Ceilings, Sidings . . . Inside or Outside the Weld-Crete way. The twelve pages of this pocket size booklet tell the story of a material that is used for bonding concrete to concrete as in laying new surfaces, patching, and similar places where it is necessary to lay new concrete over old. Tests of the material are described as well as the application. Larsen Products Corporation.
Our Identification No. 109.

Concrete Pressure Pipe Laying Instructions. This 16-page booklet tells how to lay pressure pipe without technical language. The different steps in laying pipe are clearly described in everyday language and photos or simple sketches show the operations. The text is brief and confined to the essentials needed to explain the correct procedure. Price Brothers Company.
Our Identification No. 110.

Thermoflector Masonry Units. This folder illustrates and describes a new style concrete block that contains two rows of stagered cores that have reflective aluminum insulation strips inserted during the laying operation. The folder gives the results of tests and lists the advantages that are claimed. Thermoflector Corporation.
Our Identification No. 111.

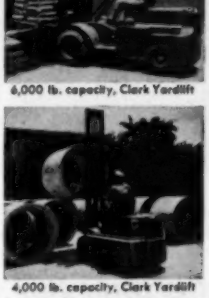
Lith-I-Block. The machine that builds success. The six pages of this folder illustrate two models of concrete block machines. Features of the machine are listed and the general advantages are explained. Testimonials fill one page and the back cover is used for drawings of the many sizes and shapes that can be produced on the machines. Lith-I-Bar Company.
Our Identification No. 112.

Blaw-Knox Buckets. Bulletin 2229. This bulletin describes and illustrates lightweight grab buckets for such operations as handling coal, coke, lightweight aggregate, cinders and similar materials. Blaw-Knox Div. Blaw-Knox Company.
Our Identification No. 113.



15,000 lb. capacity, Clark Yardlift

6,000 lb. capacity, Clark Yardlift


4,000 lb. capacity, Clark Yardlift

2,000 lb. capacity, Clark Yardlift

The New CLARK YARDLIFT-100—Here's the truck for heavy outdoor handling, Clark's *new* YARDLIFT-100. 5-tons of cargo—in lumber, building blocks, concrete and clay pipe, brick and tile, heavy metal products—handled smoothly over rough, rutted terrain. And power to spare for safe, easy high-tiering of those 5-ton loads.

Built to take the punishment of handling building materials on-or-off the job-site, the YARDLIFT-100 is a natural for all kinds of heavy, outdoor storage and handling. And Clark precision-engineering assures unbeatable efficiency over the long haul—long productive work-hours under the best or worst conditions, with amazingly low down-time.

Easy on the operator, easy on the load, the *new* YARDLIFT-100 is every bit as easy on the pocketbook. It's as cost-conscious as the company comptroller. You owe it to your profit-margin to take a look at the YARD-LIFT-100. It will put real economy and efficiency into your handling picture.

A phone call to your Clark dealer—he's listed under "Trucks—Industrial" in the Yellow Pages of the phone book—is the best and fastest way to get the facts and figures on this newest addition to Clark's famous YARD-LIFT family.

1903 1953
FIRST FIFTY YEARS
CLARK EQUIPMENT

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS · INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 90, MICHIGAN
Please send: ☐ Yardlift literature ☐ Material Handling News
☐ Have Representative Call.
Name_____
Firm Name_____
Street_____
City_____ Zone____ State_____

Floor-Slabs and Floor-Fill. This illustrated brochure describes the properties of vermiculite-sand concrete and contains specifications for designing such mixes. The insulating advantages are pointed out as well as the lightweight. The use of the material for floors on grade, and on structural floors is given. Zonolite Company.
Our Identification No. 114.

Phil-O-Seal. Colorless, Penetrating Water Repellant for all Masonry Surfaces. This folder describes a material for use on masonry surfaces to give water repellency without coloring or coating the surface. The material is described as to its penetrating action. Allied products for other surfaces are listed and directions for application are given. Phil-O-Seal Inc.
Our Identification No. 115.

Standard Asphalt Plants. Bulletin No. 525. The front cover of this four-page folder shows an asphalt plant in full color. The back cover shows a plant and close-up views of some of the important features. The inside spots some of the installations on an outline map and shows some of the unitized components that make up a plant. Standard Steel Corp.
Our Identification No. 116.

Now! For the First Time. A truly Portable Batching Plant. This four page folder illustrates a method for operating a batching plant by use of three portable components—a self-loading weigh batcher on wheels, a portable conveyor, and a transit truck mixer. Typical applications are shown and the mobility of the method is described. This is general introduction to the features of this method of concrete batching. Willard Concrete Machinery Sales Co.
Our Identification No. 117.

The Columbia Line. The New Model 12 Fully Automatic. A three-block machine is the subject of this folder. The machine is shown in several views and the important features are keyed to a listing. General points are covered in the text. Accessories such as offbearers and pallet return are covered on the back page. Columbia Machine Works.
Our Identification No. 118.

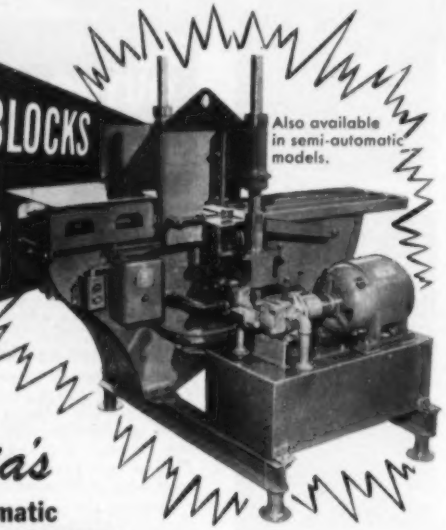
The Martin-Decker Lift Truck Scales. A scale that is connected to the hydraulic system of a lift truck is covered by this single page leaflet. The dial type scale is illustrated as well as the method of mounting. The advantages of weighing as the material is stacked or transported are cited such as avoiding floor overloading, regulation of truck loads, prevention of elevator overloads, and weight information on quantity shipping. Simple installations are included. Martin-Decker Corporation.
Our Identification No. 119.

Branford Vibrators and Accessories. Catalog No. 48. This binder-type catalog contains 14 pages of information and a price list. The catalog pages cover a complete line of pneumatic vibrators for such applications as hoppers, bins, chutes, screens, concrete forms, block machines, etc. Many different models are shown and described and specifications are included for the range of sizes in each model. Accessories—valves, oilers, clamps—are pictured and explained. New Haven Vibrator Company.
Our Identification No. 120.

Bloapco Rotary Feeder Valves. Bulletin No. 521. Dimensions, capacities, and applications of a line of rotary valves for the positive feeding or volumetric batching of dry materials are covered in this four-page bulletin. The text explains the features of the line which includes vented and unvented valves. Construction data is given in text form. Blower Application Company.
Our Identification No. 121.

Good Masonry Deserves Atlas Mortar Cement. The sixteen pages of this pocket size booklet deal with the characteristics deemed desirable in a masonry cement. In addition to explaining the desired properties the booklet contains many statements from users of the mortar cement and illustrations of projects on which it has been employed. Universal Atlas Cement Co.
Our Identification No. 122.

SPLIT BLOCKS *BOOST* PROFITS



Columbia's
Fully Automatic
BLOCK SPLITTER

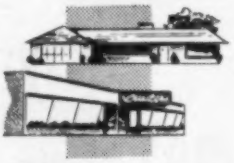
Columbia's fully automatic block splitter provides the producer with a very profitable sideline at a low capital investment. Split blocks, with infinite choice of color and pattern effects, enjoy ready consumer-dealer acceptance. They compete with, or are lower in price than, conventional clay products, yet allow the producer a comfortable profit margin.

Investigate Columbia's block splitter today. Same rugged construction, same high production capacity, so characteristic of the Columbia Line.

SALES, SERVICE and MAINTENANCE throughout the United States with headquarters in Washington, California, Wisconsin, Mississippi, Florida, New Jersey, South Carolina and Virginia. Fast service to all parts of the country.

CONTRACTORS SPECIFY *MORE* COLORED CONCRETE UNITS!

...for home and business



Split blocks offer economy as well as a limitless variety of pleasing design and color for facings on commercial store fronts or homes.

Columbia **MACHINE WORKS**
107 S. GRAND AVENUE • VANCOUVER, WASHINGTON

Time-Cycle Controllers. Bulletin No. C305. This is a 12-page bulletin that describes a line of controllers for time-cycles. They are designed for controlling industrial processes where time is a factor. The bulletin illustrates the models available and describes the principle of operation in detail. The Bristol Company.

Our Identification No. 123.

Protect the Weather Side of Your Building with Dehydratine No. 22. The four pages of this folder use photographs to show the surfaces that should and should not be treated and the results of the treatment. The six features of the product are explained as well as the general composition of the material. Specifications are given. A. C. Horn Company.

Our Identification No. 124.

Fireproofing with Perlite. Fourth Edition. This pamphlet summarizes the basic details of 32 approved fire retardant constructions using lightweight plaster or concrete made with perlite. Construction details are given for lightweight protection for columns, floors, ceilings, and partitions. Diagrams show the required thickness of perlite plaster or concrete, furring details and other basic elements to obtain the listed fire rating. Photos show some prominent buildings that are constructed with perlite plaster and concrete. Perlite Institute.

Our Identification No. 125.

Hard-Facing With Coast Metals. This 12-page booklet presents the reasons for and advantages of hard-facing. Details of applying are given and a table lists the various types of rods available, gives properties, and suggests uses. Examples of hard-facing are shown and described and a list by industries suggests rods for specific applications. Coast Metals.

Our Identification No. 126.

Colorcoat. The six pages of this folder tell the history of the product, the principle of its action, the colors available, and directions for use. The material is an oil paint and an aggregate combined to cover and seal rough masonry surfaces, cracks, and chips. Samples of the material are included as color chips. A list of other products for building preservation and repair is included. L. Sonneborn, Sons, Inc.

Our Identification No. 127.

Rust-Oleum Stops Rust. Form No. 252. A dual purpose is served by this sixteen page catalog. It includes complete instructions for surface preparation and application of rust preventing products and color chips for color selection and matching. In addition to serving as a color guide and use manual this publication also describes types of rust preventives such as primers, short oil types, long oil types, machinery and implement finishes, chemical and heat resistant types, sealers, thinning oils, and floor and masonry coatings. Rust-Oleum Corp.

Our Identification No. 128.

The Ford Tractor and Dearborn Equipment. AD-5721. This 8-page catalog gives specifications and illustrations of a line of attachments made for use with the Ford tractor. The text points out additional applications for each device. Scoops, cranes, loaders, bulldozers, scrapers, blades, snowplows and a number of agricultural implements are shown. General information on construction, operations, parts, etc., are given. Dearborn Motors Corporation.

Our Identification No. 129.

4 Entirely Different Ways to Profit with the New Clipper Convertible. This poster type folder uses color printing to show the machine and its features. Cutting of masonry composed of clay, concrete, stone, and similar materials is shown and explained. Wet or dry table portable floor saw or track saw models are shown. The Clipper Manufacturing Company.

Our Identification No. 130.

The New "truck-man" 4000 lb. capacity, Model 40 High-Lift. This is a specification sheet that gives a brief description and specifications of a lift truck that is designed specifically for concrete block handling use. Advantages of the model are given. Truck-Man Div. of The Knickerbocker Co.

Our Identification No. 131.

"Buck" that STIFF COMPETITION

with the

KENT STANDARD BLOCKMAKER

ONE MAN OPERATION

Place the pallet—push the button to start cycle—transfer finished block to the rack, while the next block is made.

AUTOMATIC CYCLING

Push-button starts cycle of automatic operations in sequence.

LOW OPERATION COST

Comparatively low power requirements result in economy of operation.

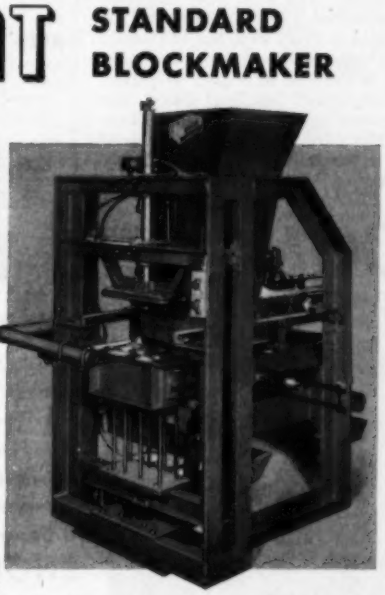
DESIRABLE PRODUCTION

One block can be produced in 10 seconds. Production of up to 360 blocks per hour is possible.

BLOCK SIZES

Per cycle—2-4" blocks; 2-6" blocks; 1-8" block; 1-10" block, or 1-12" block.

SIMPLE CHANGE OF MOLD BOX



A small investment gives you BIG OPERATOR ADVANTAGES with the KENT STANDARD BLOCKMAKER.

Check your present plant setup and write for complete information. Learn how smart block plant operators everywhere are making "sweet" profits in the face of tough competition with this rugged, versatile machine.

The KENT MACHINE COMPANY

CONCRETE PRODUCTS MACHINERY

Cuyahoga Falls, Ohio

All Concrete-Masonry Home—

(*From page* 227.)

promotion of concrete masonry for residential purposes, the owners have provided us with a cost breakdown which appears in the adjoining table. We believe the figures provide abundant evidence that concrete masonry has lost none of the economic advantages which were a primary consideration during the early years of its use.

We are certain that the home pictured here could not be duplicated in other materials at any price because competitive materials lack the versatility which is one of the best and most challenging characteristics of concrete masonry. Whether a *comparable* residence could be built at $11 per sq. ft. in the same area, but with other materials, is probably a question for professional builders to argue. The total price might be approached if extreme care were exercised at every step, but this would still leave the concrete masonry home far in the lead in respect to quality, performance, comfort, safety, and ultimate cost over a period of years.

The Park residence was designed by the architectural firm of Maxine & Mason, Alpena. Engineering work was performed by Scott Engineering of Alpena, and the masonry contractor was Les Jones.

BREAKDOWN OF COST

Excavating, Grading	$ 500
Landscaping	1,000
Footing	1,600
Walls & Partitions (Block & Mortar)	5,300
Soffit Floor, Roof (Complete)	4,000
Shoring	1,300
Electrical	2,400
Heating (Radiant)	3,800
Plumbing	2,700
Window (Aluminum)	2,000
Doors (Steel)	1,400
Roof (Insula., Tar Asphalt)	2,100
Paint (Inside)	600
Ceramic Tile (Baths, Entr. Halls)	2,000
Asphalt Tile (Activity Rm., 4 B.R., w Stairs)	1,000
Incidentals	500
Labor (Masons, Cement Finishing)	14,200
	$46,400

AREA

	sq. ft.
First Floor	2,016
Second Floor	1,952
Carport 504 sq. ft. ÷ 2	252
Total	4,220

$46,400.00 ÷ 4,220 = $10.99 per sq. ft.

Smart Promotion Plus—

(*From page* 234.)

New England, believes that the marble-faced unit can open important new markets for many block producers.

"The basic simplicity of the process," Mr. Locklin says, "makes it possible to undertake the production of marble-face units as part of a much-needed diversification program that would involve only moderate investment and little departure from established plant procedures."

Having established its product as commercially acceptable in the New York market, Marble Face Blocks, Inc., now plans to offer its patented process and production and merchandising know-how to block producers in other areas. Franchises will shortly be made available to a limited number of plants on an exclusive area basis.

The experience already gained will be used as the basis of a nationwide promotional campaign to build consumer acceptance. Although the prices at which the product is now being sold in the New York Metropolitan area (49 cents for a 4-in. block) are competitive, the company hopes to bring the price of units down to an even more attractive level.

Marble Face Blocks, Inc., is headed by William Naumburg Jr., chairman of the board, and Fred R. Driessen, president. Frank J. Lowell is vice-president in charge of sales.

Carter-Waters Promotes—

(*From page* 238.)

to assure uniform bearing. The beam was then prestressed by methods similar to those used on the "I" beam.

The members demonstrated were designed for use in a roof system consisting of prestressed Haydite soffit block beams over precast, prestressed girders, the span in each direction to be 20 ft. The units are to be used to form the roof of a new manufacturing building for Carter-Waters at their headquarters in Kansas City.

For some time now the company has been engaged in producing precast roof slabs, joist, beams, purlins, guard rails, railroad signal foundations, areaways, stepping stones, splash blocks, lintels, soffit blocks and Haydite building blocks The plant operates entirely on Haydite aggregate produced in the company's own rotary kilns at Haydite, Mo., 35 miles north of Kansas City.

COMPLETE PLANTS

from a Single Source

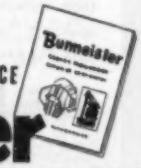
- "Tilt-Up" Mixers
- Ready-Mix Plants
- Expressway Semi-Portable Plants
- Dry Batch Plants
- Cement Bins
- Aggregate Bins
- Cement Storage

ENGINEERED TO WORK TOGETHER

From conveyor to elevator, from bin to mixer Burmeister equipment is designed and built by the same organization. Because each product is *"engineered to work together"* you are assured less costly "conversions," maximum production speed, accurate delivery of materials, and greater economy of operation. See your nearest Burmeister Distributor or write for details.

FREE CATALOG

Send for new 16-page illustrated Catalog of Burmeister Plants and Equipment.



COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4631 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

Trade Notes

The Bergen Machine and Tool Company, Nutley, N. J., has entered the block machine manufacturing field. The company has long been a supplier of parts for the machines and has now brought out a complete three-block machine of its own. Bergen Machine recently acquired a plant at Hackettstown, N. J., with 100,000 ft. of floor space. The plant includes a complete foundry and a complete machine shop, containing much heavy equipment. Overhead cranes and other facilities make the newly acquired plant ideal for manufacturing operations.

International Selling Corp. of New York City has been appointed to handle the national sales program for the Duoblok line of concrete block manufacturing machinery, made by United Industries, Inc., Miami, Florida. Distributors will be appointed throughout the United States and in foreign countries.

The sales activities will be handled by a new division of International Selling Corp., the Duoblok Division, 122 East 42nd St., New York 17, N. Y.

Another plant expansion, the second in two years, has been announced by the Columbia Machine Works, Vancouver, Wash. The new expansion program includes the erection of a 10,000 ft. assembly room and the obtaining of an additional building for storage.

A new sales policy for Yellen H-Speed Block Machines has been announced by John J. Yellen, 381 Jeffries Street, Perth Amboy, N. J.

Sales of the machines will now be handled on a selected distributor basis instead of through a national sales organization as in the past. Two distributors have already been appointed. They are: Mortarless Machine Company, 2623 Riverside Drive, Los Angeles 39, Calif., who will handle the west coast and the southwest; and the Colby Construction Company, Vineyard Haven, Mass., who will cover New England and the adjacent Canadian areas. Other territories are still open.

The Yellen machines will be manufactured by the Miami Shipbuilding Corporation, 615 SW. Second Avenue, Miami, Fla. They will also handle the repair and replacement parts business.

A. T. Penning

The appointment of A. T. Penning, Jr. St. Paul, Minn., as sales manager of the chemicals division of the Van Hoven Company was announced recently.

In his new assignment, Mr. Pennig will direct the promotion and sale of Cemtein throughout the United States. Prior to his promotion he had served in the northwest area.

Appointment of Cleveland Tramrail Toledo Company, Toledo, Ohio, as dealers in Hyster industrial truck equipment has been announced. The territory to be served by the company is the Ohio counties of Williams, Defiance, Paulding, Van Wert, Fulton, Henry, Putnam, Allen, Lucas, Wood Hancock Hardin, Ottawa, Sandusky, Seneca Wyandot, Crawford, Marion and Morrow.

Pennsylvania Block Concern Plans Improvement Program

An extensive improvement program has been planned by Ed Miller & Sons, Johnstown, Pa. This firm, which engages in the manufacture of concrete blocks, is building a new plant on the highway between Riverside and Krings. Present operations are located in Riverside.

Ed Miller, head of the firm, stated that an expenditure of at least $100,000 is anticipated for the new structure and for new equipment.

COMMENT
from the
BUTLER ENGINEER

—of Steel, Cement and "Saturation Points"

Here it is, right from the shoulder. *Never, never have we seen such activity shaping up in the construction field.* What phases? All phases! Highways, expressways, relocations, airfields . . . Atomic energy plants, off-shore concrete construction, dams, homes, buildings of all kinds . . . Concrete products plants—well, as I said,—everything!

The election results seem to have had the effect of lifting a sluice gate to release an immense flood of projects held back by the Dam of Uncertainty.

•

Will there be steel? Great Day, the supply is better now and getting better all the time. That's a fact — *not* wishful thinking. Every sign, every index, all statistics point — if not to an abundance — at least to a better than adequate flow to meet the ravenous demand.

•

Cement may be short for a time. I suggest as an answer a 1000 to 3000 barrel Butler Storage Bin to hold you through those anxious moments until the hopper bottoms roll in.

•

When I look at the number of Ready Mixed Plants (not to mention any other types) now in the engineering phase in my department, I get thinking back 20 years ago. I remember the many conferences, the gnawing anxiety all of us felt about the grave question, "Isn't the saturation point for Ready Mixed almost at hand?"

Maybe I should tell my 14 year old son to tell his grandsons that their first duty when they come into the world is to worry about the Ready Mixed saturation point.

Anyway, I'm in love with '53 already,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

A LABEL OF QUALITY

Your manufacturer of a complete line of cement block machinery.

GEORGE PRESSPAC

• MACHINES • PALLETS
• MIXERS • CONVEYORS
• AIR HOISTS

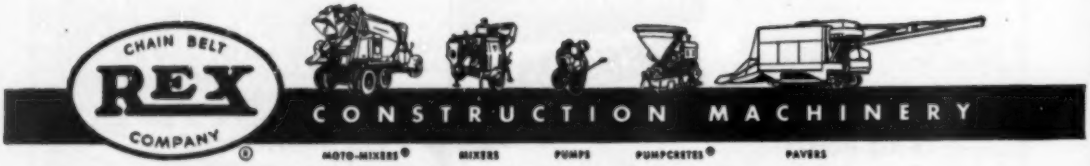
BEFORE YOU BUY, WRITE - WIRE - CALL

F. C. GEORGE MACHINE COMPANY

100 S. WESTMORELAND DRIVE — ORLANDO, FLORIDA

STOP . . .
LOOK . . .
LISTEN . . .

The Great NEW Rex 4½-Yard Adjusta-Wate Moto-Mixer



CHAIN BELT COMPANY • 4782 W. Greenfield Ave., Milwaukee 1, Wis.

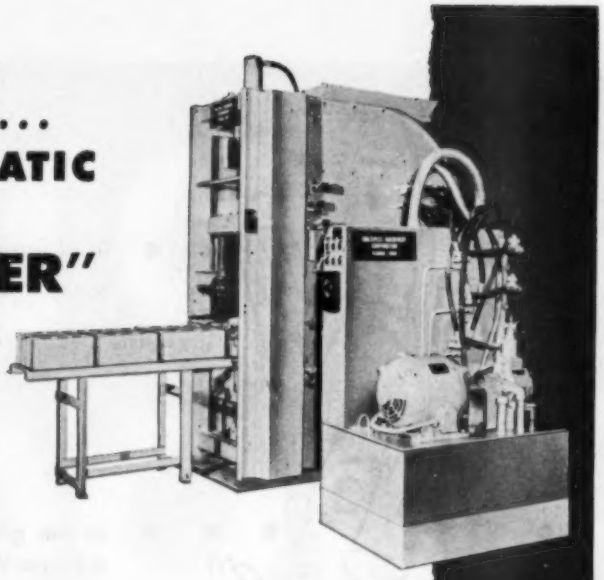
in at your Rex Distributors

at the great *new* Rex 4½-Yard Adjusta-Wate Moto-Mixer®

to the *facts* he has to tell about the *low weight, biggest legal payloads, low operating and maintenance costs* of this new addition to the Rex line of profit-making Adjusta-Wate Moto-Mixers.

For fast production of low-cost quality block . . .

BUY AN AUTOMATIC MULTICO "BLOCKMASTER"

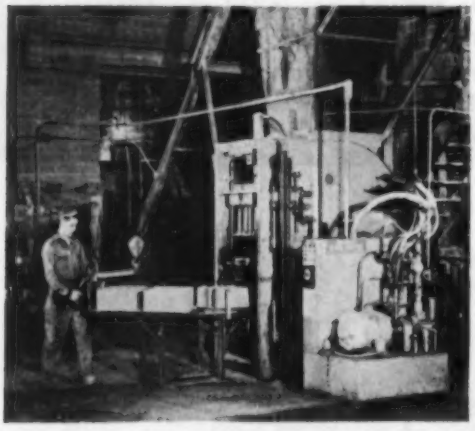


Multico BLOCKMASTER installations will pay for themselves in an average of 18 months. These durable, dependable block machines make even a small plant competitive because they mass produce all sizes and shapes of low-cost quality block. All operations except off-bearing are fully automatic and are variable to meet production needs. Install a Multico BLOCKMASTER and eliminate production bottlenecks in peak seasons.

Multico field engineers will be glad to discuss your problems and to make recommendations without obligation. Over 45 years of on-the-job experience in the industry assure you of top quality equipment and service.

Check these Features!

- LOW INITIAL COST
- MINIMUM MAINTENANCE
- FULLY AUTOMATIC
- MAKES ALL SIZES AND SHAPES
- HANDLES ANY AGGREGATE
- TAMPS UNDER POWER VIBRATION
- PERMITS QUICK MOLD BOX CHANGES
- SMOOTH, POWERFUL HYDRAULIC OPERATION
- SEPARATE POWER AND CONTROL UNIT
- AVAILABLE IN 2 and 3-BLOCK MODELS



Another Profitable "Blockmaster" Plant

This Model 2 machine is operating at 3½ to 4½ cycles per minute at the LORAIN CRYSTAL ICE COMPANY, Lorain, Ohio. John P. Kocak, Manager, reports, "The Multico machine makes good block on a production basis. It has been a profitable investment and has kept us competitive in price and quality."

WRITE FOR BULLETIN FOR ADDITIONAL DETAILS.

1250-MM

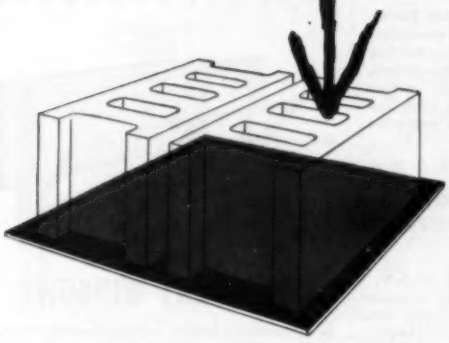
MULTIPLEX MACHINERY CO.
DIVISION OF MULTIPACK, INC.
104 FREMONT STREET ELMORE, OHIO

MANUFACTURERS OF BLOCK MACHINES • MIXERS • SKIP HOISTS • STRIPPERS • ELEVATORS

Longer-Lasting...

PLAIN STEEL PALLETS

for Block Machines



guaranteed
FLAT, SQUARE *and* **TRUE**
all excess burrs removed!

Plain steel pallets...specially made for your own size cement block machines by one of the nation's largest manufacturers of flat steel pallets. Guaranteed to stand up under constant usage. Fast service *now* on the following sizes for all well-known makes of block machines, including Besser, Stearns, Gocorp, Lith-I-Bar, Multiplex, Fleming, Kent, Columbia etc.

5/16"—18-1/2" x 26"	5/16"—18" x 20"
1/4"—18-1/2" x 26"	1/4"—18" x 20"
5/16"—18" x 18"	5/16"—18" x 19"
1/4"—18" x 18"	1/4"—18" x 19"
5/16"—18" x 22"	5/16"—18-1/2" x 18-1/2"
1/4"—18" x 22"	*OTHER SIZES ON REQUEST*

SHIPPING POINTS...

- **NEW YORK, N. Y.**
- **BLADENSBURG, MD.**
- **NILES, OHIO**
- **CLEVELAND, OHIO**

WEST COAST BLOCK MANUFACTURERS!
Write for special dockside prices for direct delivery to your ports!

Sturdy Steel **BLOCK RACKS**

Durable, longer-lasting steel block racks. Easy to assemble. Provide many years of service under most rigorous conditions of use.

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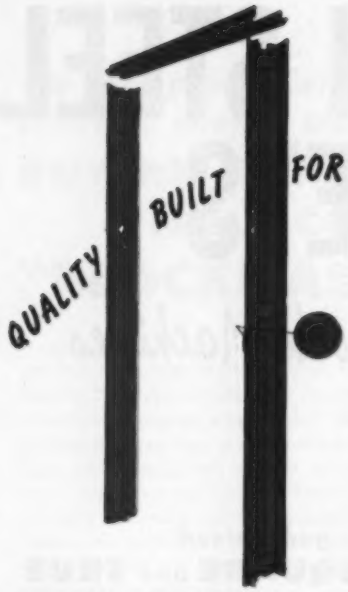


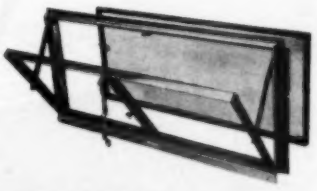
QUALITY BUILT FOR QUALITY BUILDING..

kewanee BUILDING PRODUCTS

SOLD THROUGH DEALERS ONLY

KEWANEE STEEL DOOR FRAME

Something new in door frames. The first metal door frame practical for dealer handling. Modern and beautiful in appearance. Lower first cost; lower installed cost. Shipped knocked down. The door frame builders are asking for.



KEWANEE BASEMENT WINDOWS

America's largest selling basement window. Heavy, tight-fitting, ruggedly constructed. Made in both steel and aluminum. Putty or puttyless glazing. Screens and storm sash available.

STEEL & ALUMINUM UTILITY WINDOWS

Here is an excellent market for this fine window. Widely used in garages, filling stations, and miscellaneous small buildings. Constructed of heavy rolled sections. Putty or puttyless glazing.

LARGE COMMERCIAL STEEL WINDOW

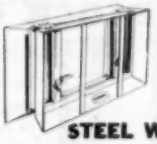
A large window for commercial or industrial use. Two vents; heavy, hot-rolled sections. Screens available. Mullion bars to combine windows in groups.

STEEL MORTAR BOX

Smooth interior. No joints, seams or rivets. Formed from single sheet of rust resistant steel.

FORMED STEEL LINTEL

Kewanee Lintels are formed of heavy gauge steel, have ample load-bearing capacity. Legs are corrugated for greater strength.



STEEL WINDOW BUCK

The very best and cheapest method of installing Kewanee steel basement windows in poured concrete foundations. Eliminates labor and material for making wood forms.

OTHER KEWANEE BUILDING PRODUCTS

Commercial Steel Windows • Flue Cleanout Door • Fireplace Ash Dump • Portable Chutes for Handling Ready Mixed Concrete • Coal Hole Rings and Covers • Bell Trap Cesspools • Cistern Rings and Covers • Cast Iron Ventilation Grates • Sewer Tile Strainers • Brick Carriers • Adjustable Flue Thimbles • Built-in Adjustable Mail Chutes • Window Wells • Standard Industrial Windows

Kewanee's precision-built products assure dealers of worth while profits, and the return business of satisfied customers. Write for full details on prices and dealer discounts.

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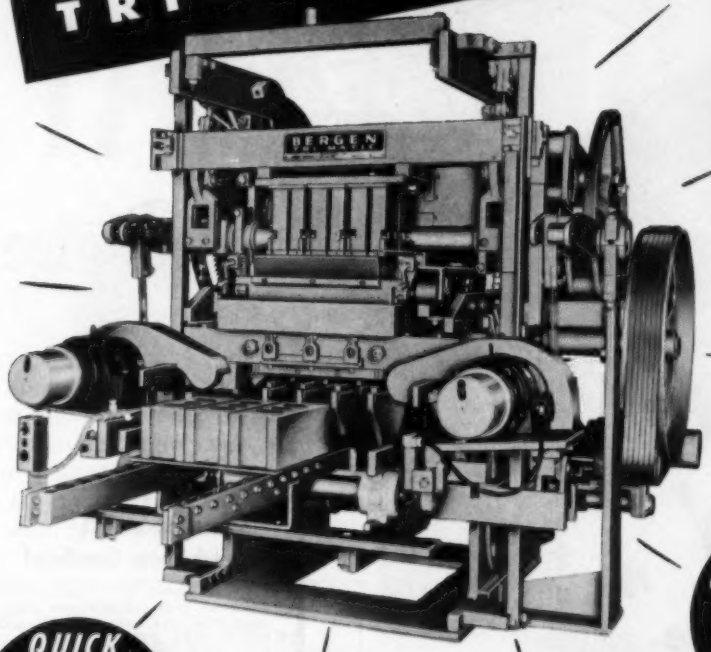
553 Burlington Street North, Kewanee, Illinois

BASEMENT COAL CHUTE

Made of steel and guaranteed against breakage. Locks securely. Door is tight-fitting. Slotted hinges hold it open during coal delivery.

THE BERGEN TRI-MATIC HIGH-PRODUCTION BLOCK MACHINE



NEW HIGH SPEED CAM DESIGNS

QUICK CHANGE CUT-OFF DEVICE

OUTRIGGER BEARING SUPPORT

QUICK CHANGE AGITATOR GRID DEVICE

LONG-LIFE BRONZE GUIDE LINERS

QUICK CHANGE SPLIT SPROCKETS

MORE THAN NINE HUNDRED 8-INCH BLOCK PER HOUR

Although the BERGEN TRI-MATIC is shipped set up to make 750 block per hour, production of 900 or more per hour can be attained with the proper materials.

Block plant operators who own or have observed the Bergen Tri-Matic perform are convinced you can't beat its efficiency and the clean-cut, uniform block which are produced hour after hour without interruption.

If your plant is lagging behind in production, it will pay you to contact us for additional information and prices. (No obligation of course.)

Phone us "COLLECT" . . . NUtley 2-7300

BERGEN MACHINE & TOOL CO., INC. 189 FRANKLIN AVENUE NUTLEY, NEW JERSEY

"He Might Need It..."

"He never was much for letter-writing when he was in college. But he must know how anxious Mother and I are . . . now that he's off in Korea. Haven't heard from him in six weeks. Of course, they say 'no news is good news' . . . but I wonder. Maybe he can't write . . . because . . . maybe he's in a hospital somewhere. And maybe he needs blood. I don't know . . . but I'm not taking any chances. That's why *I'm* giving blood."

* * *

Yes, all kinds of people give blood —for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of cooperation?
- ☐ Was information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

In Industry after Industry

YALE

sets the pace

Give this great YALE truck every test you know. Run it fully loaded on ramps, indoors and out. See the power it delivers... the fuel economy it gives. Let operators test it for smoothness...for maneuverability... for safety...and you'll see why it's the standout truck of this or any other year.

Features no other truck combines

1. Fluid Drive...gives 3 to 8 times longer clutch life
2. 65 HP industrial engine built for rugged continuous service
3. Automotive Type Brakes with extra braking surface
4. Shockless steering...for greater operating ease and safety
5. Hypoid Gears oil-sealed against dirt and dust, give drive 30% more strength against shock loads

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A line that meets every materials handling need

Whatever type of truck will serve you best—Gas, Electric or Diesel powered—you'll find it in YALE's comprehensive line.
Also ask for full information on the numerous attachments Yale makes available for special handling problems.

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☐ Please have your local representative call for an appointment

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Gas, Electric, Diesel Lift Trucks • *Worksavers* • Hand Trucks • Hand and Electric Hoists • Pul-Lifts

It's the NEW Blue Brute 600' portable air compressor

A BIGGER Compressor for your air tools

Here it is . . . biggest and most powerful of all Blue Brute Portable Compressors! This 600' unit *really* costs less to operate, with its *low* fuel consumption and the *minimum* maintenance it calls for.

Just check these Worthington features it incorporates:

Air-operated fuel-saver control that keeps fuel consumption way down (never a pound of unnecessary air pumping, automatic unloading at idling speeds, engine speed in ratio to air requirements) . . . hydraulically controlled clutch for really easy operation . . . identical stack-type, oil-bath air cleaners on engine and compressor for easy servicing . . . two full-length tool boxes with ample capacity . . . two-piece side panels for better temperature control and easy handling by one man . . . unit core radiator and intercooler, offering maximum cooling surface . . . frame protected fuel tank for easy, low level filling . . . three-point engine and compressor mounting . . . formed steel channel frame, semi-elliptical spring mounting and automotive-type steering.

There's even more you'll want to know about this new portable compressor. Write for Bulletin H-850-B74 to Worthington Corporation, Construction Equipment Division, Plainfield, N. J.

ENOUGH AIR IS LEFT OVER in this hookup with the new Blue Brute 600' and with two 4-inch wagon drills to operate the heavy-duty rock drill in foreground!

H.2.4

If It's A Construction Job, It's A *Blue Brute* Job

Complete CONCRETE PLANT SERVICE

by

"Fanning Schuett"

Concrete Plants
Designed, Fabricated
and Erected
under ONE Contract

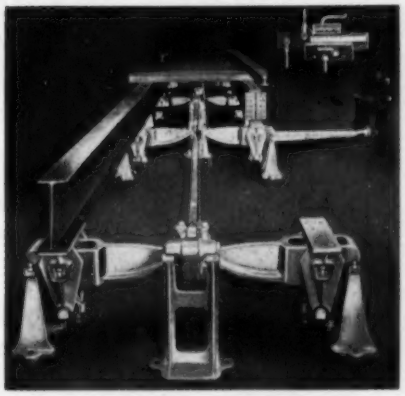
CENTRAL MIX TYPE CONCRETE PLANT

of G. & W. H. Corson — Plymouth Meeting, Pa.

- Bin is eight (8) compartment
- Batcher and Mixer 2 cu. yd.
- Belt Conveyor is 24" x 240'
- Mixer carried on separate concrete piers

CEMENT STORAGE BINS

in highway construction plant of contractor. Steel bins, of 400 bbls. each, are shipped completely assembled and welded, ready to lift up in one piece. Screw Conveyor arranged for re-circulation.



TRACK SCALE

Railroad track scales. Capacities of 80 tons or 125 tons.

- Concrete Plants — either central mix or dry batch.
- Cement storage bins and batchers, with elevators, etc.
- Bins, Elevators, Screw Conveyors, Belt Conveyors, Batchers, Scales.

Write for full information

Fanning Schuett

ENGINEERING CO.

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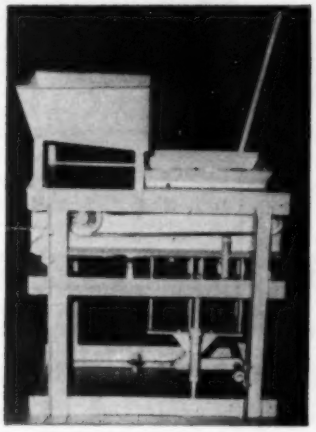
MISTER BLOCKMAKER

HERE'S what You've been waiting for!! a REALLY NEW line of Block Machines



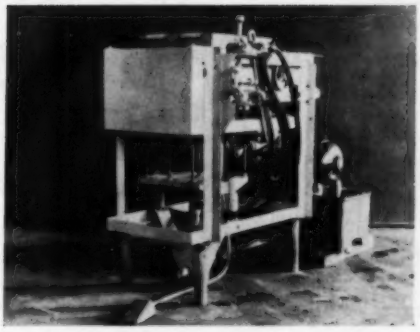
The Duoblok Junior

A manually operated machine with double core box for making two 8"x8"x16" blocks or equivalent per operation. New vibration principle provides a more uniform block with less vibration time. Rated capacity of 1500 standard blocks per 8-hr. day.

At last you can have a modern high production plant for an old-fashioned low investment.

DUOBLOK machines are the most up-to-date on the market today. All the latest advancements in block making machinery have been built into these new, modern machines.

They will greatly improve your production, and will bring added dividends in customer goodwill with the appearance, accuracy and quality of the block they produce.



The Duoblok Senior

(Mounted on temporary legs for shipment)

A hydraulically operated model of the Duoblok Junior. Strike-off and ejection of the blocks are done hydraulically for greater speed and less operator fatigue. Rated capacity of 2000 standard 8"x8"x16" blocks per 8-hr. day.

The DUOBLOK line also includes the DUOBLOK Hi-Speed semi-automatic and automatic block machines, mixers, skip-hoists, slump block machines and accessory equipment.

For further details see your local DUOBLOK distributor or write directly to

INTERNATIONAL SELLING CORP.

DUOBLOK DIVISION

122 EAST 42nd STREET
NEW YORK 17, N. Y.

8" and 12"
TROUGH BELT CONVEYORS
Sand • Gravel • Redi-Mix
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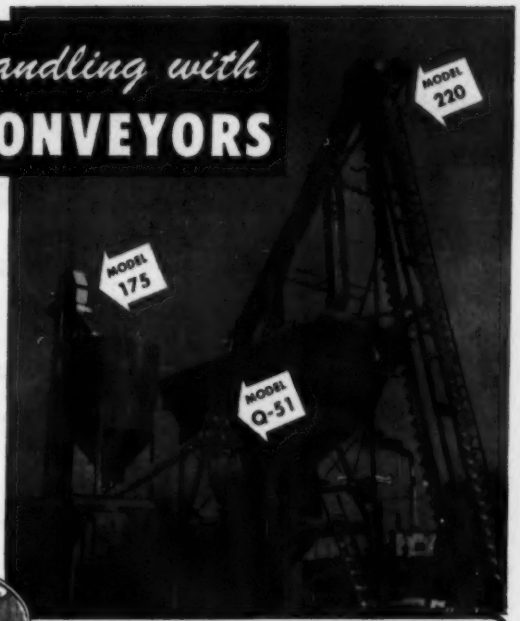

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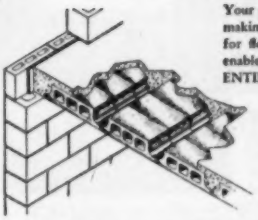

Illustration at left shows integral joist and slab of reinforced concrete. Meets standard building code requirements. Recommended by architects and builders.

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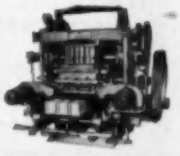

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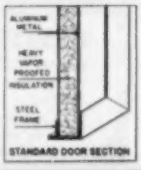

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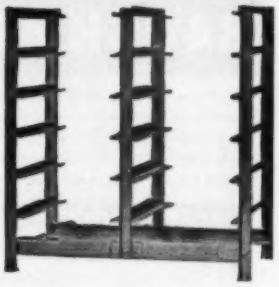

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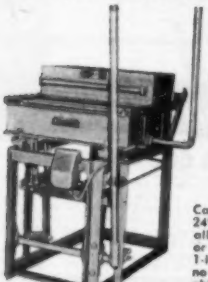

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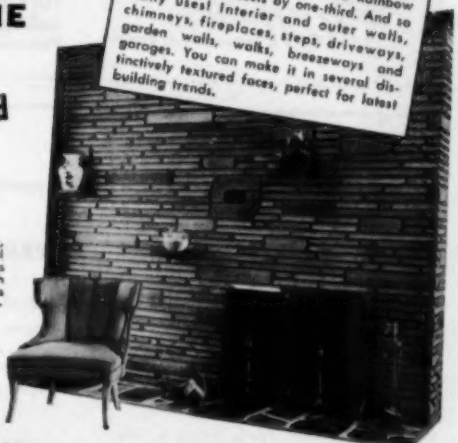

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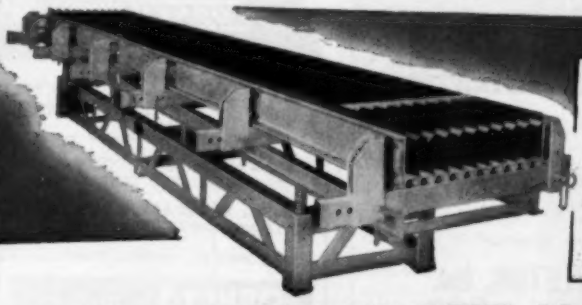

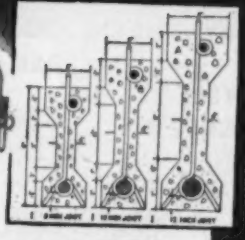

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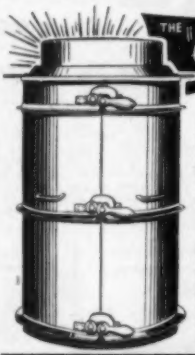

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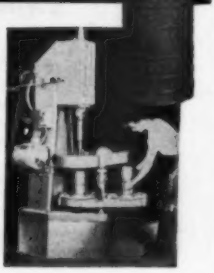

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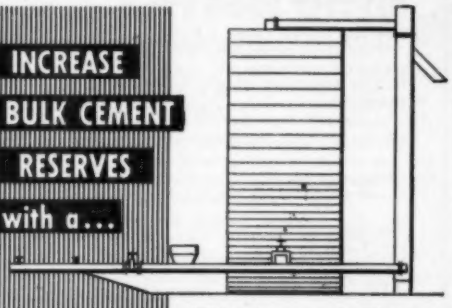
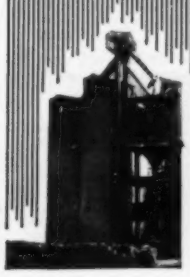


MARIETTA storage system



With a large capacity MARIETTA storage system, with its multiple silos, you can stockpile bulk cement reserves, avoid shortages and keep your production high. As the sketch shows, MARIETTA concrete stave silos can be used with pneumatic conveyors, or any type of materials handling equipment. These sturdy, fire-resistant tanks give you large capacity, low cost handling, keep your bulk cement in an "always ready-to-use" condition. Write for details on new methods for storing, handling bulk cement.

The MARIETTA Concrete Corp.
MARIETTA, OHIO

BRANCH OFFICES:
501 Fifth Ave., New York 17, N. Y.
Pulaski Hwy. at Race Rd.
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Columbia's NEW, IMPROVED Fully Automatic 2-BLOCK

Leads the field in fast production of high quality blocks!

Rugged construction dependable operation, low initial investment—backed by years of manufacturing experience—assure the Columbia owner more profitable block production.

Columbia's Model 8, with electronic controls, is today's outstanding 2-block machine! Write today for details!

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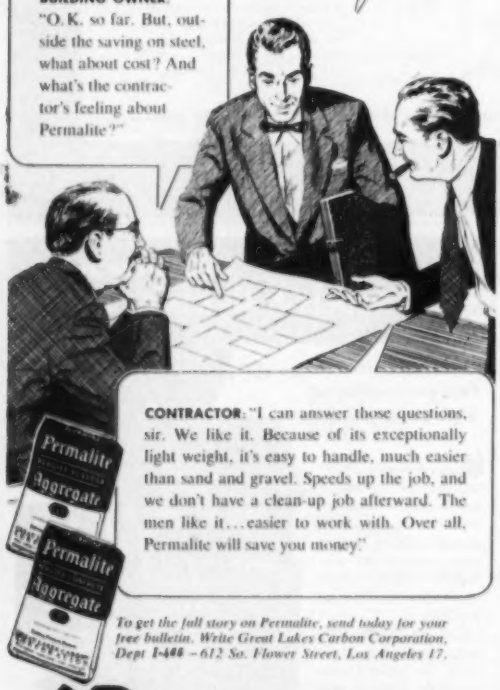
Sales, parts and maintenance headquarters in Washington, California, Wisconsin, Mississippi, Florida, New Jersey, South Carolina, Virginia.

Columbia MACHINE WORKS
107 S. GRAND AVE. VANCOUVER, WASH.

There are lots of advantages in every sack of PERMALITE

ARCHITECT: "As I explained to you earlier, sir, we've been able to reduce the structural steel requirements on your building by figuring to use Permalite for both concrete and plaster. With Permalite as the aggregate, we'll have a concrete with only one-third to one-half the weight of regular concrete – and with ample strength. Our curtain walls can be lighter and thinner, with improved insulating values. And here, on the columns and ceilings, Permalite/plaster will give us tremendous savings in both dead load and expense . . . and meet all code requirements by giving us up to 4-hour fire-ratings, too."

BUILDING OWNER: "O.K. so far. But, outside the saving on steel, what about cost? And what's the contractor's feeling about Permalite?"



CONTRACTOR: "I can answer those questions, sir. We like it. Because of its exceptionally light weight, it's easy to handle, much easier than sand and gravel. Speeds up the job, and we don't have a clean-up job afterward. The men like it . . . easier to work with. Over all, Permalite will save you money."

To get the full story on Permalite, send today for your free bulletin. Write Great Lakes Carbon Corporation, Dept 1-446 – 612 So. Flower Street, Los Angeles 17.

Dependable GREAT LAKES **Permalite**®

THE LARGEST-SELLING PERLITE AGGREGATE IN THE WORLD

PROCESSED FROM PERMALITE AND ALKITE ORES ONLY BY THESE EXCLUSIVE PERMALITE FRANCHISEES OF GREAT LAKES CARBON CORP.

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TRANSO SCORES AGAIN! with the MODEL TLF-150

1½ yd. 4-Wheel Drive Load Master

AND HERES WHY...

1. **Powerful 4-wheel traction and floatation.** Utilizes *full* Loader power through maximum gripping action of tires.
2. **Patented "Bucket Rocking Action."** Assures fast, safe, *heaped* loads in seconds—uniform down pressure on hydraulic cylinders rocking the bucket smoothly into the load.
3. **Rugged, compact overall design**—clutch type reversing transmission with 4 speeds forward and reverse, powerful industrial engine, Torque Converter, heavy-duty axle assemblies of 16 to 1 ratio.
4. **No engine clutch**—replaced by highly accessible transmission master clutch at rear of machine that cuts reversing time 95% and is *completely replaceable* in 30 minutes.
5. **Full power steering.** Affords finger tip control . . . adds maximum maneuvering and handling ease.
6. **Simple, convenient arrangement of operators controls.** Provides greatest operating efficiency and comfort.

FRONT-END LOADER

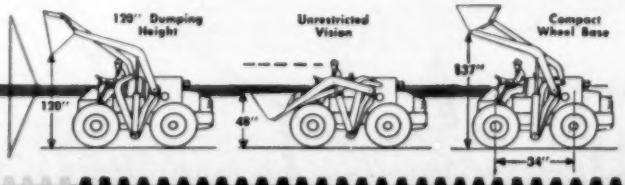
84" wheel base — 120" dumping clearance—137" bucket hinge clearance—80" maximum height—93" maximum width.

Whether loading, hauling, reversing, or dumping, Transo's big new TLF-150 LOAD MASTER efficiently combines traction and power with high traveling speeds.

Because of its unusually short wheel base and extended bucket lift arms a full 120" dumping clearance is possible. Its low 48" bucket carry position, allowing unrestricted visibility for the operator, adds safety and greatly contributes to the loader's perfect weight balance.

PATENTED and PAT. PEND.

3 KEY FEATURES OF TLF-150 DESIGN



TRANSO

WRITE for additional information on the 1½ yd. TLF-150 as well as the other LOAD MASTER models—the ½—¾ yd. TL-50 and 1—1¼ yd. TL-100.

THE TRANSMISSION & GEAR CO.
10421 HAGGERTY AVE. • DEARBORN, MICH.

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Manufacturers of High Grade Concrete Block Machines
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you will find MURPHY DIESEL sales, parts and service facilities convenient, prompt and dependable

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Generator Sets
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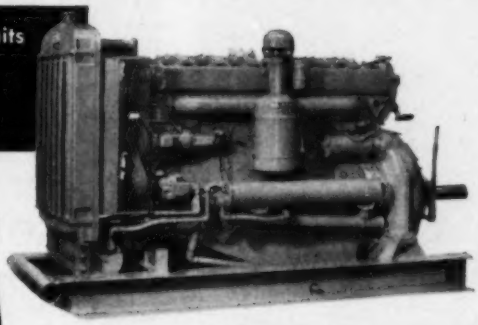
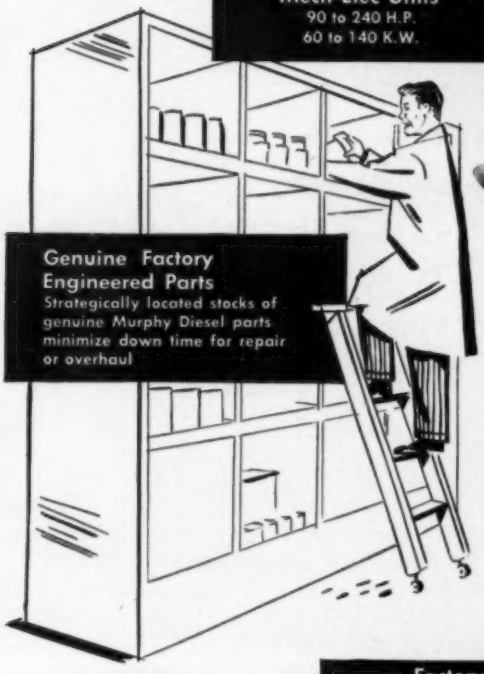
90 to 240 H.P.
60 to 140 K.W.





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Strategically located stocks of genuine Murphy Diesel parts minimize down time for repair or overhaul

Factory Trained Service Specialists
Dealer servicemen are trained in the newest and best service techniques right in the Murphy factory

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MURPHY DIESEL

***Heavy duty power* for rock crushing**

Murphy Diesel engines and power units are available in sizes from 90 to 226 H.P. Engine speeds are 1200 and 1400 rpm.

"Packaged" generating units are available with capacities ranging from 60 to 140 K.W. A.C. or D.C. voltages.

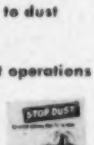
LOOK HOW YOU CAN STOP DUST

for 1/10 Usual Cost

Here are some of the advantages hundreds of rock crushing plants throughout the country are getting with a Johnson-March dust control system:

- **Dust stopped right at its source**
- **Healthier working conditions**
- **Less machinery maintenance due to dust**
- **Inexpensive installation**
- **No interference with normal plant operations**

For more information on how a Johnson-March dust control system can help solve *your* dust problems, send for this FREE ILLUSTRATED BROCHURE today!



PQ-8

THE JOHNSON-MARCH CORP.
1724 Chestnut St., Philadelphia 3, Pa.

At no obligation I'd like to know more about the Johnson-March system of dust control, and how it can help my plant stop dust and save money. Please send FREE ILLUSTRATED BROCHURE.

NAME..... TITLE.....

COMPANY.....

ADDRESS.....

CITY..... STATE.....

For positive dust control in your plant, it will pay you to look into the low-cost advantages of a Johnson-March system. At a cost as little as 1/10 that of most other types of dust handling systems, the dust in your plant can be controlled or eliminated by a Johnson-March system. Fast and inexpensive installation can be made wherever dust occurs in your plant . . . at jaw crushers, cone crushers, conveyors, screens and unloading bins . . . without interfering with normal plant operations. Johnson-March systems can control dust for YOU effectively and economically.

Johnson March

Specialists in Dust Control

1724 CHESTNUT ST. **Philadelphia 3, Pa.**

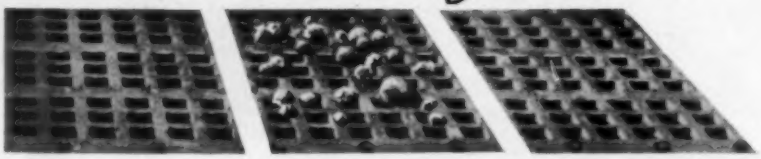
Wire Rope at Work—As you draw near New York City at the northern end of the 118-mile New Jersey Turnpike, this is the bridge that carries you high above the Passaic River. The picture, taken at a time when the bridge was near completion, shows two 146-ton girders for the main span being lifted simultaneously into place by Bethlehem Wire Rope.

These heavy steel girders made a tough lift, but no tougher than thousands of others entrusted to Bethlehem rope all over the country. Wherever there are heavy lifting or hauling jobs to be done, you will find Bethlehem rope right in the thick of things, hard at work. You will always know it by the black-and-yellow reel, the reel that tells you, "Here a good product is in service."

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

Before... and... After...



the screen is the same!

Hendrick Perforated Metal Plate assures a long life of service on vibrating and shaking screens. Available in any desired shape or size of perforations, it can also be supplied flat or corrugated in proper gauges of regular, high carbon, and high tensile steels and in other commercially rolled metals.

Full open clearance reduces blinding to an absolute minimum. Decks can be changed fast and easily, saving valuable time and labor costs. Write for more information.

Hendrick
MANUFACTURING COMPANY
39 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

PERFORATED METAL • PERFORATED METAL SCREENS • WEDGE-SLOT SCREENS
ARCHITECTURAL GRILLES • MITCO OPEN STEEL FLOORING • SHURE-SITE TREADS • ARMORGRIDS

Dragline, Clamshell, Custom-Built Buckets Stone and Wood Grabs

WELLMAN *Williams Type*

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts? Write for free descriptive bulletins

THE WELLMAN ENGINEERING COMPANY
7014 Central Avenue
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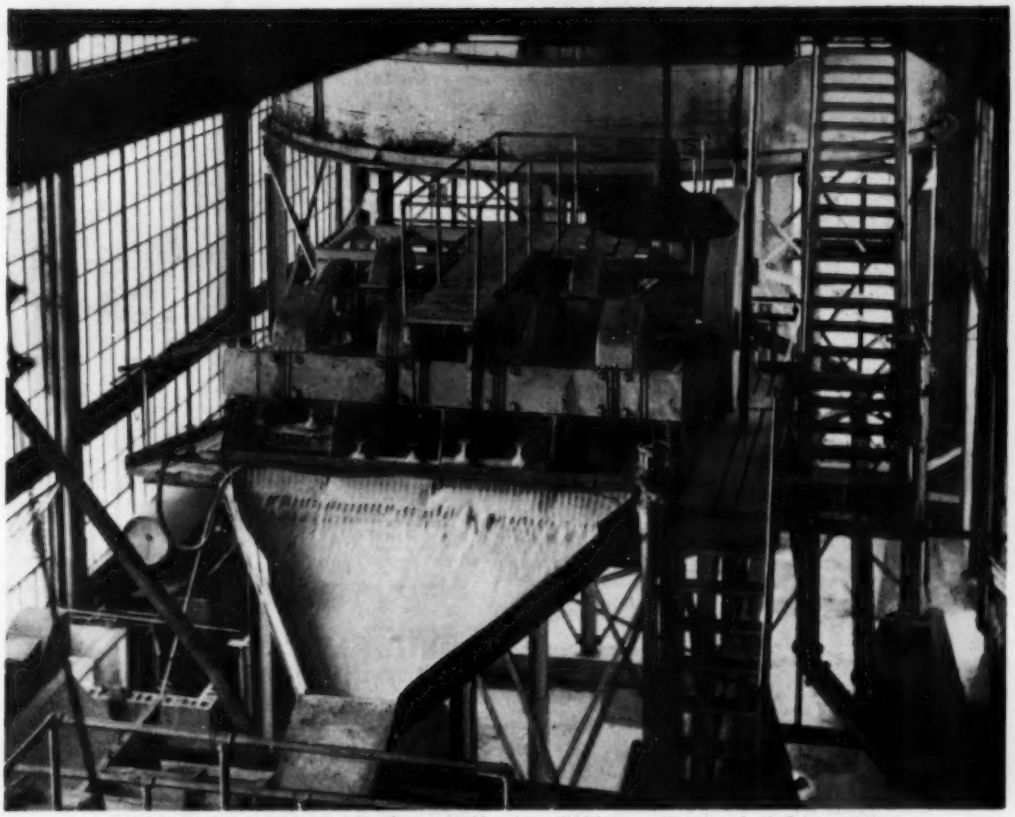

A Dorr Hydroseparator and two Dorr Classifiers are used by a large Mid-Western sand producer for desliming, scrubbing, washing and dewatering. The Dorr Hydroseparator and Classifiers are operated in series to produce a high grade commercial minus 28 plus 150 mesh product.

Two additional Dorr Classifiers have recently been installed to meet increased production demands.

No Lost Sand Production *Here* . . .

Five years of continuous operation . . . no lost production for repairs . . . and hardly a penny spent for routine maintenance.

That's the story on this job. And it is typical of the sand plants, large and small, where Dorr equipment is in operation.

For equipment that will serve you year after year *without high maintenance costs*, it will pay you to get in touch with Dorr. Whatever your production requirements, there is Dorr sand plant equipment scaled to fit your individual requirements. Ask a Dorr Engineer for the facts.

DORRCO

Better tools TODAY to meet tomorrow's demand

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

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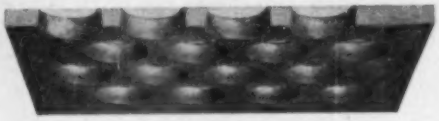
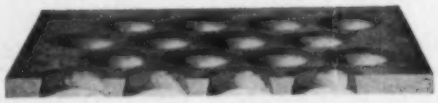
Install "CROSS" SCREENS for all 'round Sizing Superiority



Under Side of Plate — Note absence of burr



Top Side of Plate — Note conical holes

the "CROSS" method of Die-Perforating Cross Special Analysis *Screen* Steel with SQUARE, HEXCREEN or ROUND Perforations on *close* Centers provides ACCURACY OF PRODUCT SIZE, with LESS BINDING and LONGER SCREEN LIFE

Look for this Stamp on all "Cross" Products

the Sign of PLUS QUALITY for PLUS PERFORMANCE

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Rising costs of production and shrinkage of profit margin emphasize the continued need for economy at every possible point. You can save fuel and improve kiln operation by providing your Burner with a continuous record of oxygen, carbon dioxide, and combustibles in the flue gas. A continuous record of oxygen permits complete control of the air supply; combustibles analysis indicates oxygen demand under all conditions; the carbon dioxide record reflects the state of the calcining process.

Records the whole story continuously on a single chart.

Diligent use of the Cambridge Gas Analyzer results in lower fuel consumption, more uniform product and dollars saved!

Send for literature

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PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

TAKE A LOOK AT YOUR HAULAGE COSTS!

excessive? BIG? HIGH? too much? HIGH? wasteful?

16 ft. long trailer dump, capacity of 11½ yd. sides and 16 yd. ends lifted by a twin ram 7" single sleeve twin telescopic hoist.

Call on Galion! Take advantage of up-to-date information on the latest, most efficient dump truck equipment. Let your Galion distributor survey your needs, and make common sense, economical recommendations which will solve your equipment problems — quickly!

A-7202

PHONE US TODAY.

You'll get action . . . and satisfaction.

THE GALION ALLSTEEL BODY COMPANY

GALION, OHIO

Teeth that really Dig!

WITH THE *Positive Locking* FLEX-PIN CONNECTION

H&L TOOTH CO.

(Pioneer Manufacturers of Two-Part Teeth)

1540 So. Greenwood Ave. • Montebello, California

Li'l Champ says:
Edges are hard surfaced prior to placing equipment in service.
Let us tell you more about "Wear Devil A" Electrodes. Write for full information.

CHAMPION

"Wear Devil A" Electrodes increase hook service life as much as three times!

Field tests prove that **"Wear Devil A"** deposits on the wearing edges afford impact and abrasion resistance far superior to that of non surfaced grappling hooks.

Due to excellent bond between weld and base metal, **"Wear Devil A"** deposits will not spall or crack despite the most severe service conditions.

When hooks have become worn they can be resurfaced without having to remove any of the old deposit.

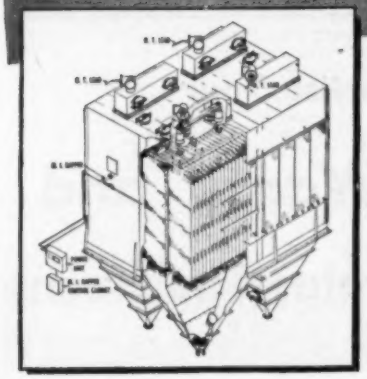
Hardness averages 53 — 58 Rockwell C.

THE CHAMPION RIVET CO.
CLEVELAND 5, OHIO • EAST CHICAGO, IND.

NEW!

COTTRELL M-I RAPPER

ELIMINATES ALL FOUR...



1. **No more rapping puffs.**
2. **Automatic operation—conveniently located remote control panel provides complete control plus surveillance.**
3. **No dampers in inlet and outlet of precipitator are necessary.**
4. **No sections need be taken out of service for rapping.**

HERE'S HOW IT WORKS: The new Research Corporation Magnetic Impulse Rapping System uses continuous, sequential, low intensity vibrations to keep thinner average coating on collecting electrodes. This method maintains optimum electrical conditions for continuous high efficiency dust collection. Ask your Research Corporation Field Engineer for complete data on this important new development, or write to us directly.

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RC 141

Automatic SAFETY HOOK

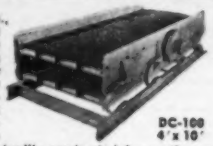
It's EVANSTEEL

The very latest type of Safety Hook made of super-strength alloy steel with tensile strength of 125,000 psi. Due to the self-locking feature, the instant the load is applied, the hook closes and locks automatically. Load is carried entirely by a socket on the interior of the bail, into which the hook engages . . . no heavy load stress on pin bolt. Hook knob remains seated in socket as long as load is applied, no matter how slight. When load is released, hook readily unhooks.

For safe, fast handling of cable loads, use EVANSTEEL Automatic Safety Hooks . . . available in capacities of 2 tons and up.

CHICAGO STEEL FOUNDRY CO.
Kedzie Avenue and 37th Street • Chicago 32, Illinois
Makers of Alloy Steel for Over 40 Years

Boosts Portable Crusher Output With KOLMAN Vibrating Screens



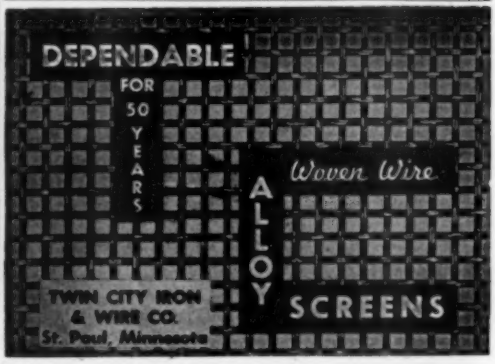
DC-100
4' x 10'

J. L. Healy Construction Co., Sioux Falls, S.D., finds KOLMAN vibrating screens step up capacity at portable crushers operating throughout South Dakota. Full throw is maintained under both heavy and light pressure for clear, accurate separations without clogging or blinding. "Floating action" prevents transmission of vibrations to attached equipment. Screens are sturdily constructed for continuous operation with minimum upkeep.

Channel type of frame construction makes KOLMAN screens easy to install. Flat operating position consumes little headroom. Weight kept at minimum. Single and multi-deck models in wide range of sizes shown in new BULLETIN 112.

Write for it today!

KOLMAN MANUFACTURING COMPANY
4800 W. 12th St. Sioux Falls, South Dakota



Advertise Your

"Wants" and Surplus Equipment

HETHERINGTON & BERNER

DREDGING PUMPS

performance-proven on the toughest jobs

H&B ESTABLISHED 1887

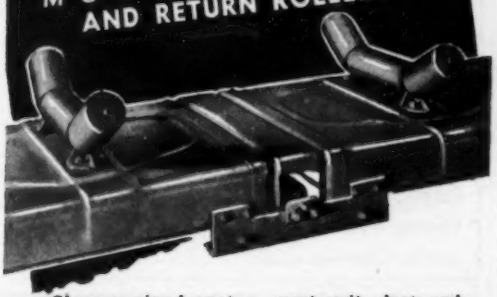
Hetherington & Berner sand and gravel pumps are available in two general types: *STANDARD*, (4", 6" and 8" sizes) with semi-steel parts, for ordinary working conditions and moderate heads; and *DREADNAUGHT*, (6", 8", 10", 12" and 15" sizes) with manganese steel parts, for heavy duty jobs with stringent head conditions.

Write for Bulletin DP-147.

HETHERINGTON & BERNER INC.

717 Kentucky Ave. Indianapolis 7, Indiana

M & C TROUGHING IDLERS AND RETURN ROLLERS



- Close-grained cast iron for greater resistance to abrasion and corrosion.
- Closed ends keep out dirt.
- Specially made "SKF" ball bearings and method of mounting reduce friction to minimum.
- Dirt proof bearings: closed upper end and grease labyrinth prevent grit, dust and dirt from penetrating.
- Return idlers made of seamless steel tubing with smooth finish.
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SLAG SHOVEL OPERATORS SAFER, HEALTHIER WITH DRAVO CRANE CAB COOLER

DUQUESNE SLAG PRODUCTS COMPANY ELIMINATES WORKING HAZARD

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CRANE CAB COOLERS PROVIDE YEAR-'ROUND AIR CONDITIONING IN MANY INSTALLATIONS

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Dravo Crane Cab Coolers and Conditioners are eliminating similar working hazards for crane operators in open-hearth, stripping and hot-coil storage operations . . . in foundry, pickling and reduction work . . . and in aluminum, copper, magnesium, lead, chemical and cement production.

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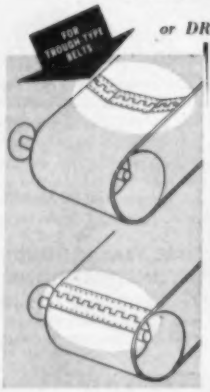

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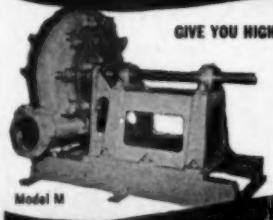

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10x11	Worth.	HB	100	294
9x9	Worth.	HB	100	211
8½x9	Worth.	HB	100	170
7x7	Worth.	HB	100	122
7½ HP	Worth.	AT833	100	35
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Euclid Trucks 13 Ton—22 ton End Dump—15 Yd. and 23 Yd. Bottom Dumps—12—25 Yd. Bottom Dump without tractors.

4—Elec. Std. Ga. Dump Car locomotives—600 volt with 17—std. ga. air dump cars—25,000 lb. cap. 130 Cu. Ft. lovel with all elec. equip. Goodman 10 Ton Mine Loco—250 Volt 36" Gauge. Ottumwa Mine Hoist—1⅛" Rope—200 H.P. Motor—525 R.P.M. complete.

Jaw Crushers 36" x 48" Nordberg—36" x 48" Farrel —60" x 48"—42" x 40"—42" x 36"—24" x 36"—18" x 36"—15" x 36" Symons Cone 5½'—4'—3'—2'—50 x 40 Dixie hammer mill—54" Traylor Type T—42" McCully—48" Gyrosphere.

Shovels — Ball Crushers — Rod Mills—Ball Mills — Rotary Kilns — Dryers—Log Washers — Classifiers— Mine Hoists—Transformers—Motors—Gravel Plants— Blast Hole Drills—27T-29T-42T Generator Sets— Drag Lines.

2—25' A.C. Log Washers.

STANLEY B. TROYER

Theatre Bldg. Tel. 500 Crosby, Minnesota

13-B Telsmith Gyratory Crusher
10-24 Ball Bearing Jaw Crusher
10-36 Ball Bearing Jaw Crusher
14" x 26" Acme Jaw Crusher
10" x 20" Jaw Crusher
¾ Yd. Byers Shovel, old
Koehring Gas Dumpster
100 H.P. Motor
75 H.P. Motors—and smaller motors.

BLUE BALL MACHINE WORKS

Blue Ball, Pa.

Gyratory crushers, Tels. 25A; 20", A-C 27". P&H 1055 diesel dragline; 1400 elec. shovel. Koehring 605 diesel 1½-yd. crane-drgln. (4). Marion 93M diesel 2½-yd. shovels (2). Bucyrus-Erie 54B diesel 2½-yd. shovel. Marion 7½- and 4-yd. shovels, elec., diesel. Bucyrus 120B elec. 4½-5-yd. shovels. Monighan Walker draglines, 3 to 12 yds. Locomotives, 7 to 80 tons, diesel, gas. Bucyrus 2¼-yd. shovel att. only, 55B-52B.

H. Y. SMITH CO.

828 N. Broadway Milwaukee 2, Wis.

AIR COMPRESSORS—Used 210 CFM and 315 CFM. Gas powered, Good Condition, W/pneumatic tires, Electric starters. Priced for quick sale.

AIR COMPRESSOR & CRANE SALES CO.

1424 W. Ohio Street
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ATTENTION . . .

QUARRY, ROCK AND CONSTRUCTION OPERATORS

FOR SALE:

DUAL-OPERATED EARTH-SEPARATION PLANT

Manufactured by the CONVEYOR COMPANY, INC.

LOS ANGELES, CALIF.

CAPACITY 1300 CUBIC YARDS PER HOUR

Consisting of the following items:

NO. 1—DUMPING STATION:

4 Each 4'0" x 40'0" I Beams
2 Each 2'0" x 40'0" W.F. Beams
2 Each 2'0" x 30'0" W.F. Beams
4 Each 2'0" x 30'0" Standard I Beams
5 Each Support and Cross Member Columns

NO. 2—STATIONARY GRIZZLY TO HANDLE MINUS 12" MATERIAL:

1 Each 24'0" Raker — Consisting of the following:
18 Each 2" x 12" x 12'0" Vibrating Bars
2 Each Model No. L82 Lorain Shovel Sticks with Saddles
2 Each 15 H.P. General Electric Reduction Motors
2 Each 30 Cubic Yard Hoppers
2 Each 60" x 15'0" Pan Feeders
2 Each 20 H.P. General Electric (11 Speed) Variable Speed Motors

NO. 3—CONVEYOR SYSTEM:

2 Each 42" x 110'0" Inclined Conveyors complete with 90'0" Truss and Walkway, Head and Tail Steel Sections, necessary 8" Channel Stringer Section and consisting of the following:
2 Each 42" Corrugated Rubber-Lagged Head Pulleys, 6" x 30" Brake Drum
2 Each 50 H.P. Heavy-Duty, Gear-Reduction, High-Torque Motors

NO. 4—STEEL SCREENING AND LOADING STRUCTURE:

1 Each Two Floor Structure Complete with Stairway, Handrail, Provision for Operator's Platform at Top Floor, Provision for Gate Operator's Platform at Lower Floor, and consisting of the following:
2 Each 72" x 14'0" Robins "Gyrex" Vibrating Screens powered by 15 H.P. Motors
1 Each 25 Cubic Yard Minus 3" Hopper
1 Each 48" x 16'6" Pan Feeder to Loading Trucks
1 Each 20 Cubic Yard Cobble Hopper
1 Each P & H 10,000-lb. Electric-Operated Hoist to Operate Cobble Hopper Chute

NO. 5—SPRAY-MOISTENING UNITS:

2 Each Sets Spray Boxes under First Pass Grizzlies
2 Each Sets Spray Boxes under Second Pass Grizzlies

NO. 6—ELECTRICAL SYSTEM:

1 Each 6'0" x 8'0" Panel Switch Box Completely Enclosed and Including Automatic Compensators for Stop and Start of Pan Feeders by Remote Control

****WILL SELL ALL OR SECTIONS OF THE ABOVE.**

SPECIAL ITEMS

6 Each Model 49FD 10 Cubic Yard End Dump Euclids
11 Each Model 71FDT 17 Cubic Yard Bottom Dump Euclids
13 Each Model 43FDT 13 Cubic Yard Bottom Dump Euclids
4 Each 42" x 5'0" Symons Vibrating Grizzlies (Unit will Handle 2" to 8" Material)
1 Each 48" x 12'0" Pioneer 4-Deck Vibrating Screen Bin Mounting, Motor Mounting and V-Belt Drive

ALL EQUIPMENT ADVERTISED IS OWNED AND OFFERED FOR SALE BY:

HAWTHORNE-MICHAELS COMPANY

Contact or Call:

LOS ANGELES,
4631 E. Shella St.
Phone: Angelus 1-8118 or Logan 0230

SAN FRANCISCO,
2200 Jerrold Ave.
Phone: Mission 7-3631

CHICAGO,
122 S. Michigan Ave.
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All the above items are available for immediate delivery. Located and inspection can be made at the Cachuma Dam Site, 26 miles north of Santa Barbara, California.

BUY WITH CONFIDENCE FROM A LONG ESTABLISHED COMPANY With AAA-1 Rating

Our 36th Year

ROTARY KILNS:

2—7′ x 60′ Calciners, made by Struthers Wells. Each 9/16″ shell, Timken roller bearing supports, L-B gear reducer, with V-belted AC motor, firing hood, seal ring, one with Manitowoc Recuperator, in excellent condition.

1—6′6″ I.D. x 12′ Rotary Nodulizer or Furnace, ¾″ shell, Timken roller bearing rolls, gear reducer and motor drive, scraper conveyor, feeder, etc.

ROTARY DRYERS:

1—8′ x 54′ Struthers-Wells, Timken roller bearing supports, gear reducer, 40 H.P. motor, furnace, burner, etc. ....

8—6′ x 40′, 5′ x 40′ Ruggles-Coles; 54″ x 25′ Class Xf-4 Ruggles-Coles, also 3—3′ x 50′, x 5′ x 50′, 6′ x 60′, 7′ x 70′ Direct Heat. Also 3—6′ x 50′ Louisville Rotary Steam Tube.

3—3′ x 50′ Rotary D. H. Dryers or Coolers.

6—Link Belt Roto-Louvre Dryers: #207-10 (2′ x 7″ x 10′) #310-16, #503-10, #604-20, two #604-24.

CRUSHERS:

Jaw—2″ x 6″, 6″ x 15″ Sturtevant; 18″ x 36″ and 24″ x 36″ Farrel; 42″ x 48″ Traylor; Rolls: 42″ x 16″ Allis-Chalmers Type B; 24″ x 32″ Penna. single roll. Portable Plants—Cedar Rapids 1036-BBB; 2540-AAAA, 2036-AAA, also Pioneer with 30″ x 42″ primary and secondary crushers, all Diesel driven.

PULVERIZERS:

1—5 roll Raymond High Side.

6—#1, #0, #00, #000 Raymond Mills.

3—#0, #00, 8″ Raymond Screen Mills.

2—#51 Raymond Imp Mills.

2—Mikro #2TH, #4TH.

BALL AND TUBE MILLS:

6—Hardinge Mills, 3′ x 8″, 5′ x 22″, 6′ x 22″, 8′ x 48″.

4—Tube Grinding Mills, made by Traylor E. & M. Co. Allentown, Pa. Silex lined, 4′ x 13′, 4′6″ x 18′6″, 5′ x 22′ and 5′ x 20′. Also 2—5′6″ x 20′ iron lined, with motors.

8—Pebble Mills, porcelain lined; 3—6′ dia. x 8′, 800 gals. each. 1—6′ x 5′, 3—5′ x 4′, each with ball charge.

AIR SEPARATORS:

2—Raymond 6′ and 16′ dia.; 1—8′ Gayco; 1—16′ Sturtevant.

VIBRATING SCREENS:

3—Selectro 3′ x 8′ 2-deck; 1—3′ x 8′, 1-deck, all totally enclosed, heavy duty.

1—3′ x 6′ Colorado Iron Works, 1-deck.

2—4′ x 10′ Tyler Niagara, 2-decks.

8—Tyler Hummer, 3′ x 5′, 4′ x 5′, 4′ x 10′. Also #38 4′ x 10′.

DORR CLASSIFIERS:

2—2 stage Washing Classifiers, each with two rakes in tandem, in steel trough 26′6″ long x 3′ wide, with drives.

1—6′ x 14′ Hardinge Rotary Counter Current Classifier, also used for dewatering and scrubbing.

Also Shovels, Cranes, Draglines; Jaw, Gyratory and other Crushers; Symons and Telsmith Cones; Complete Portable Crushing Plants; Rotary Kilns and Coolers; Air Compressors; Conveyors; AND FULL LINE OF CHEMICAL PROCESS EQUIPMENT.

CONSOLIDATED PRODUCTS COMPANY, INC.

17-19 Park Row, New York 38, N.Y.

BArclay 7-0600

AIR COMPRESSORS

BELTED: 255, 330, 370, 1000, 1300 & 1570 Ft.
ELECTRIC: 207, 1305, 1752, 2850, 3176 & 3700 Ft.
DIESEL: 185, 315, 420, 500, 602, 907 & 1906 Ft.

CRANES — DRAGLINES — SHOVELS

8—Elec. Shovels, 17, 10, 5, 4, 2 & 1 Yd.
4—Walker Draglines, 2-6-9-16 Yd.
5—25 & 40 Ton 150 Ft. Boom Whirleys.
7—Loco. Cranes 20, 25, 30 & 40 Ton Diesel & Steam.
8—Diesel Shovels & Cranes, 1 to 5 Yds.

DUMP CARS

40—KOPPEL, 1½ Yd., 24 & 30 & 36 & 42 In. Ga., V Shaped.
115—3 Yd., 3 Yd., 4 Yd., 36 In. Ga.
60—84 Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
6—10 Ton Phoenix Quarry cars-std. ga.

GRINDING MILLS

Hardinge 5′x22″, 6′x22″, 8′x22″, 10′x36″ & 10′x48″.
Ball Mills 6x6, 6x10, 7x6 & 8x6.
Rod Mills 4x7, 5x14.
Tube Mills 5x18, 5x22, 5½x20 & 6x22.

PULVERIZERS

Hercules Junior 3 Roll Mill.
#1 & 3 Raymond Automatic.
B&W and Riley Coal Pulverizers.
#613 Raymond Bowl Mill.

SEPARATORS & CLASSIFIERS

5′, 8′, 14′ & 16′ Air Separators.
6′x14′ Hardinge Counter Current.
Dings Magnetic Type IR 3 Stage 60″.
Dorr 40′ Dia. x 36″—3 Tray, 4 Comp. Thickener.
Standard Thickeners—12′ to 60′ Dia.
Bahr & Bowl Classifiers, 4x32x10 DSFXB, 6x30x13 DSFB, 6x22 DSF, 6x25 & DSFX.
#1 & 2 Womco Heavy Media Separation Mills.

HAMMER MILLS

Jeffrey 36x24 B, 24x36 B, 42x36.
Williams 830 Sluzzer & 66, No. 4, 5 & 7 Jumbos.
Cedar Rapids 2032, 3023 & 4023.
Gruendler 2XB, 3XD & 5XD & 6XD Reversibles.
Pennsylvania: C-4-30, SXC-15-50, SXT-11 & 13.
Iowa 20-30 Impactor.

ROTARY DRYERS & KILNS

60″x35′ & 70″x47′ Ruggles Coles XB Indirect.
Double Shell: 70″x32′ & 70″x47′.
Single Shell: 4x26, 4x45, 5x50, 6x35.
Kilns: 4x45, 6x60, 5½ & 7x80, 8x80 & 8x125.

BLAST HOLE & WELL DRILLS

Loomis 44, Keystone 51 & 71.
10—IR—FM2—Wagon Drills.
1—Bucyrus Erie 39T Diesel.

JAW CRUSHERS

Blake Type—42x60, 30x36, 24x36, 18x36, 12x30, 12x24, 12x16.
Single Shaft—18x36, 15x30, 15x30, 10x40, 10x30, 10x20.
Cam & Roller—24x40, 14x26, 11x26, 10x20, 6x20.

GYRATORY FINE REDUCTION CRUSHERS

Newhouse 7″, 10″, 14″—Kennedy 10S, 25S, 37S—Sup. McC. 6″—Al. Chal. 222R, 222R, 530R—Traylor TY 36″.

GYRATORY STD. REDUCTION CRUSHERS

8″, 10″, 14″ & 20″ Sup. McC.—Gates Al. Chal. #2, 4, 5, 6, 7½, 9, 9, 12.
Parts for 42″ McCully.

STEEL DERRICKS

GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 13 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 125 Ft. Boom.

ASPHALT & OIL TANKS

15—8000, 10,000 and 20 000 gal cap. with coils.

RAILROAD CARS

100—8500 & 10,000 gal. cap. Tank Cars.
100—50 Ton & 70 Ton Battleship Gondolas.
20—50 Ton Cap. Flat Cars.
10—Side Dump Covered, 70 ton Hopper Cars.

LOCOMOTIVES

DIESEL: 15, 30, 45, 65 & 100 Ton.
GASOLINE: 2 Ton, 3 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 5 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 6 Ton, 8 Ton, 17 Ton & 40 Ton.

CONVEYOR BELTS

6000 Ft. 36, 42, 48 & 60 In. Wide.

SCREENS

VIBRATING: 3x8, 4x8, 5x5, 4x8, 4x10, 4x12 & 5x12
HUMMER, NIAGARA & ROBINS, LINK BELT.

COMPLETE PLANTS BOUGHT

R. C. STANHOPE, INC.

60 E. 42nd St. New York 17, N. Y.

CRUSHERS: 10x20 Rogers, 10x36 Champion, 15x36 Gruendler & CR, 18x36 & 20x36 CR, 24x36 Farrell 24x50 Champion, 30x42 Univ, 48x36 Farrell, 42x48 Traylor JAW, #12, 25 & 27 Kennedy, 13B & 16B Telsmith, 7′ & 10″ Newhouse, GYR. 2′ Symons, std. & S.H. CONE.
54″x30′, 6x25 & 6x50′ DRYERS.
MILLS: Williams Comet & Raymond 6 roll high side. 4½x24′ Hardinge Ball.
20 ton Brownhoist, 25 ton McMyler Loco. Cranes, 5 ton Robbins & Myers OET Crane, 28½′ span.
9″ & 10″ Dredges.
DRAGLINES: Lindsey K12, Koehring 304, Lorain L41 P&H 455A & 1055LC, 9W Monighan.
SHOVELS: Bay City 25, Buckeye 70, Link Belt LS75, NW25 & Marion 7, Lorain 77, Bucyrus 75B, Lima 602 & 1201.
42″x40′ Dwight Lloyd SINTERING MACHINE.
Loco: 45 ton G.E. Diesel Elec. 83 ton Steam Switcher std. ga.
Repres: Bonded Scale and Machine Co. Thurman Machine Co.

MID-CONTINENT EQUIPMENT CO. INC.
8321 Gannon St. Louis 24, Mo. Wydown 2626

FOR SALE

Rotary Kiln 7′ x 45′—⅝ shell, Link-Belt. Like new condition.

R. E. MANLEY
1050 Ogden Dunes Gary, Indiana

Equipment Values!

Tractor-Dozer—Caterpillar Diesel D6, ser. 35R4515, standard gauge, with LaPlant-Choate hyd. angledozer. Cat Diesel engine completely overhauled about 500 hours ago, FOB Paducah.....$5,000.00

Engine-Power Unit—Cat Diesel D17000Y, ser. 2381761. Heavy duty V8, 190 HP Diesel engine. Looks and runs right. Just serviced and ready for work. FOB Paducah, Ky.....$5,380.00

Conveyor—Northern Mod. B24, belt type, powered by Howell 5 HP elec. motor, mounted on 2 pneumatic tires. 3-roller type idlers. General purpose conveyor in brand new and sold at exactly our cost. FOB Louisville.....$1,001.00

Air Compressor—Gardner-Denver 500 cu. ft. ser. 246810567, powered by Cat Diesel engine; 2 years old; hourmeter 3596. A-1 condition. FOB Louisville.....$7,950.00

Motor-Grader—Adams Diesel Model 511, ser. 21523. Tandem grader with Interna. UD 14 Diesel engine. Front tires, 7.50x24 10-ply, are 70% good; rear tires 13.00x24, 8-ply, about 50% new. Has 12 ft. moldboard. Priced to move fast. FOB Evansville, Ind.....$2,700.00

ROY C.
WHAYNE
SUPPLY CO.
800 W. MAIN ST. • LOUISVILLE, KY.
Evansville, Ind. Paducah, Ky.

FOR SALE

One Austin-Western 1024 Jaw Crusher, serial # 10272, with 40″ x 12″ pulley left hand, 40″ x 12″ pulley, right hand, manganese jaws, Pittman seats and wedges.
One Austin-Western 1036 Jaw Crusher, serial #4181, with 12″ x 40″ right hand and left hand pulleys, manganese jaws, Pittman seats and wedges.
Both of these crushers are in excellent condition and are reasonably priced. Offered subject to prior sale.

TELFORD EQUIPMENT COMPANY
319 East North Street
Lansing 5, Michigan
Phone 4-1468

FOR SALE

Champion Drain Tile Machine with attachments for making 4″ - 5″ - 6″ and 8″ cement tile.

PHONE 2556
HAGERSTOWN, INDIANA

FOR SALE

1—36″ FC Telsmith Gyrasphere Crusher complete with drive and Caterpillar D 13000 Diesel Engine. This machine has been operated 577 hours.

PALMETTO QUARRIES CO.
P.O. Drawer 5185 Columbia, S. C.

200 TPH DIESEL PORTABLE SCREENING & CRUSHING PLANT.
32″ x 40″ PRIMARY CRUSHER.
12′ FEEDER & MURPHY DIESEL.
10″ x 36″ SECONDARY CRUSHER.
40″ x 24″ ROLLS.
4′ x 14″ D.D. VIB. SCREEN.
G.M. DIESEL.
ALL MOUNTED PNEU. TIRES.
COMPLETE BINS—ELEVATORS—CONVEYORS
MFG. BY AUSTIN WESTERN.
J. C. SEALY 60 E. 42nd St., N.Y. 17, N.Y.

WANTED

Tractors, bulldozers, cranes, shovels, air compressors, low boys and tandem trailers. Phone, wire, or write

WEBBER & CO.
Box 8037 Chattanooga 11, Tenn.
Phone 4-2622

FOR SALE

ANDERSON DIESEL
2 Cylinder—326 R.P.M.—Type "K" Model 22—No. 5348—60 H.P.

FARREL-BACON CRUSHER
Style "A"—18" x 36" Jaw Type.

WESTINGHOUSE MOTOR
75 H.P.—695 R.P.M. Induction Motor No. 13A—Style 129516A—220-440 Volt—3 Phase Ser. No. 1463039.
Also new spare bearings, controls and grids.

TRAILER
"Jahn" full trailer—12 ton capacity 8' x 16'6"—Tires 7.50 x 20.

FLYNN WEICHSEL MOTOR
75 H.P. synchronous—1800 R.P.M.—Type 225 Ser. No. 38078 also controls and grids.

CROCKER-WHEELER MOTOR
10 H.P.—1140 R.P.M.—Type 5C—Size 15Q Ser. No. 519431.

CROCKER-WHEELER MOTOR
50 H.P.—SIZE 121Q—1160 R.P.M.—Ser. No. 142990.

WESTERN ELECTRIC GENERATOR
D.C. generator—Ser. No. 246151—Frame E—Type ML—Form 3KWGN—72 Amps—1600 R.P.M.—125 Volts.

FARBER WHITE LIMESTONE CO.

Franklin, New Jersey

FOR SALE

30 ton Industrial Brownhoist Loco. Crane. 150 HP Climax gas engine. 70' bm. 8 wheel. Double drums. Reconditioned.

65 ton Gen. Elec. diesel-elect. switching locomotive. 400 HP Cummins engines. 0-4-4-0. New 1943. Completely rebuilt.

1½ yd. Koehring 605 diesel crane, like new. GM 6-71 Diesel. 140' bm. Long tracks. Tagline. 4 yrs. old. Bargain.

MISSISSIPPI VALLEY EQUIPMENT CO.
513 Locust St. St. Louis 1, Missouri

FOR SALE
EAGLE WASHERS

1 - **Serial No. 1596, Size 57" x 15' Double Screw Coarse Material 24" Dia. Flights.**

1 - **Serial No. 1595, Size 72" x 15' Double Screw Coarse Material 30" Dia. Flights.**

Both of these washers in first class condition.

KANAWHA SAND COMPANY
Box 607 - Parkersburg, W. Va.
Phone 75481

AVAILABLE
SUPERB RIVER QUARRY SITE

At the crossroads of the Northeast on the Hudson near Newburgh, N.Y.

About 70 acres . . . never quarried . . . elevation to 250 feet . . . adjacent overburden diaposal area . . . highway, mainline railroad and barge basin on property . . . underwater land rights included . . . test samples meet highway department specifications for trap rock.

Write or telegraph
E. A. LUTHY
ROSETON-ON-HUDSON, NEW YORK

MODERNIZE AND ECONOMIZE WITH BONDED

Conveyors, Conveyor Parts, Belting, Screens, Crushers and Scales. Reduced prices. Immediate shipment.

BUILD YOUR OWN CONVEYORS

3-roll Troughing Idlers for these sizes:

14" belt	$16.50	30" belt	$19.50
16" belt	17.25	36" belt	20.25
18" belt	18.00	42" belt	21.00
24" belt	18.75	48" belt	21.75

1-roll Return Idlers for these sizes:

14" belt	$6.38	30" belt	$8.25
16" belt	6.75	36" belt	8.75
18" belt	7.13	42" belt	9.50
24" belt	7.50	48" belt	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Rust-proof ball races; maintenance is negligible.

CONVEYOR BELTING

Famous brands at deep cut prices. New; fresh stock.

Width	Ply	Top Cover	Bottom Cover	Duck Carcass	Price
18"	4	1/16"	1/32"	28 oz.	2.50/ft.
24"	4	1/16"	1/32"	28 oz.	3.23/ft.
30"	4	1/16"	1/32"	28 oz.	3.97/ft.
36"	4	1/16"	1/32"	28 oz.	4.70/ft.
48"	4	1/16"	1/32"	28 oz.	6.16/ft.

HEAD AND TAKEUP PULLEYS

All welded steel head and tail pulleys and assemblies complete.
Priced from $60.00

PRICES SLASHED ON NEW TROUGHING IDLER CONVEYORS

We will take our loss on our stock of short length belting and previous model idlers and return rollers in made up conveyors. You can save as much as 50% by buying the BONDED CONVEYOR SPECIALS listed below and accepting your conveyor belting in two pieces. These idlers, belting and conveyor sections are all new. Be dollar wise and take advantage of this saving.

Quant.	Belt Width	Conveyor Length	List Price	Sale Price
1	24"	25'	$1322	$ 657
1	24"	45'	2062	1085
1	24"	100'	4097	2037
1	30"	25'	1421	806
1	30"	65'	3101	1583
1	30"	125'	5621	2748

Note: All belting in 4 ply, 28 oz. duck belt with 1/16" top rubber cover and 1/32" bottom cover.

PAN AND RECIPROCATING FEEDERS

Complete with motor and drive. 15 to 225 tons per hour capacity. Priced from $423.00.

CLOSING OUT, NEW D.C. MOTORS; 230 Volt

H.P.	Winding	RPM	List Price	Sale Price
3	Comp. & Shunt.	1750	$276.19	$100.00
5	Shunt	1750	438.95	165.00
7½	Comp.	1750	530.19	195.00
*7½	Comp.	1200	700.00	225.00
15	Comp.	1150	937.00	380.00

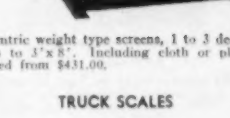
*This is a Marine type motor with shaft on both ends.

VIBRATING SCREENS

Heavy duty eccentric-shaft types; 1 to 5 decks, 3'x 8' to 5'x 14'.

Eccentric weight type screens, 1 to 3 decks; sizes to 3'x 8'. Including cloth or plates. Priced from $431.00.

TRUCK SCALES



20 Ton Truck Scales	$525.00
26 Ton Truck Scales	582.00
33 Ton Truck Scales	895.00

CINDER, PUMICE, PERLITE CRUSHERS

For crushing cinders, pumice, perlite, volcano ash, limestone chips and other similar materials.

Capacities to 100 tons per hour. Priced from ..... $470.00 including steel hopper

BONDED SCALE AND MACHINE COMPANY
110 Bellview PHONES: GArfield 2186; FRanklin 6-8898, Evenings. Columbus 7, Ohio

SPECIAL OFFERING

1—New Acme 16" x 5' heavy duty reciprocating feeder —stock delivery

1—Factory rebuilt Acme 18 x 32 Jaw crusher.

ACME ROAD MACHINERY COMPANY
Frankfort, New York

CARLYLE
INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

STRAIGHTCUT DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FIRE, WATER, SUCTION, AIR, STEAM AND WELL HOSE AND MORE

WHY WAIT
We have 8 to 48
RUBBER CONVEYOR BELTING

TOUGH COVERS — Heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.

STRONG CARCASS — Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.

FLEXIBILITY — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features: troughs easily, runs true on all idlers, gauge resistant, excellent for long and short hauls and slope installations.

Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
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30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
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